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THE NAVAL AVIATION SAFETY REVIEW

TECHNOLOGY & SCIENCE

MAR 27 1964

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As a result of recent Naval Aviation Safety Center liaison visits and other day-to-day contacts with the operating fleet, it has become apparent that many people do not have a correct or complete appreciation of the Navy's aircraft accident prevention program.

This applies also to the role of the Naval Aviation Safety Center in the effort, and the values to be gained by fuller fleet participation in developing the safety program.

If every person concerned in any way with naval aviation could make a short tour of the Safety Center, this situation would be rapidly remedied. Since this is impossible, let's join in with a new squadron skipper and his new safety officer who have stopped by to see first hand what goes on at the Center. We're in the front office, greetings have been exchanged, coffee served and we hear Rear Admiral E. C. Outlaw, Commander of the Center, speaking

"GOOD afternoon, gentlemen. It's a distinct pleasure to have you visit with us. We hope that in the future others will do so.

"What are your impressions of the Center?"

"I am amazed, sir! And pleased to find that the people of the Center are so obviously acquainted and concerned with our fleet problems."

"How about you, Lieutenant?"

"Well, sir, I never realized the vast amount of information that you have available here in the Center, nor the im-



portance of my reporting troubles or difficulties. Now I can see why you emphasize reporting so much. With the total viewpoint of the Navy's problems, your people here are in a position to really help us get needed aircraft service changes, more reliable engines and components, better flight gear, and sounder maintenance procedures."

"I'm glad that you have been able to get this impression first hand, because our experience has been that it is difficult for a publication or field visit to give you this feeling and appreciation.

"Our slogan — 'Mission Readiness Through Safety' — is not an empty phrase on a unit insignia, but an expression of the dedication we know you share with us towards the development of a more effective naval air force. Today's commitments are many, and their very intensity and complexity dictates that we must succeed in conserving our equipment, our people and our resources.

"In this day of cost effectiveness, I'd like to point out one significant factor. Probably both of you have some sort of a personal investment program as a hedge for the future, and college education for the kids. You also are federal income taxpayers and so have an appreciation for the load you are carrying. We like to think of the safety program . . . in particular the Center, for it represents probably our biggest single expenditure in accident prevention . . . as an investment. How much return are we, are you, and other taxpayers getting on your money?

"Well, let's make some comparisons. Last year, accidents alone cost us nearly \$300 million in damaged or destroyed aircraft, the cost of a Forrestal class carrier for example! Incidents, with their damage and repair, produced another \$100 million or so in losses . . . to say nothing of the obvious loss of efficiency and morale when any accident or incident occurs. The biggest tragedy . . . and more irreplaceable expense . . . is the loss of some 200 pilots and other aviation personnel last year. Just a minimum training investment in a pilot would be a million dollars each.

"The total, as you see, makes ours a more than a half billion dollar deficit business annually! The cost to run the Center's prevention program? Just one tenth of one percent! In other terms, the Center's budget represents approximately the cost of one A4.

"My good friend, Jerry Lederer, Managing Director of the foremost non-government civilian agency engaged in flying safety development, says that 'few people talk about the accidents that are prevented whereas, everyone talks about the ones that do occur!' We need reports of your accident prevention efforts in order that we can improve the support



to you. Like any good program we expect and indeed welcome, constructive criticism, comments and questions. Our doors and our minds are open.

"We feel that we have only begun to fight in this safety business. The easy things to prevent accidents have already been done. The very leveling off of the downward slope to the accident rate shows this to be the case.

"I'm sure you've noticed from the 'Weekly Summary' that our current accident picture is not bright. We hope that your efforts and ours will curtail some of the adverse factors — such as fatalities, dollar costs, and number of destroyed aircraft. But I would like to give you a rundown on what we are doing as part of our current program to advance safety and halt this particular trend of the moment.

"It will take a maximum effort to outflank the various problems we face, and to make certain that we surface and make best use of the vast talent, experience, knowledge and resources available in the Navy to apply to these serious problems. For our part, we've embarked on an assault program — the following are but starters, with others to be continued from our mutual working together.

- Increased visits and safety surveys to operating units to beat the time gap and paper curtain in recognizing trends and problems.

- Annual conferences with manufacturers of each major aircraft in the inventory to bring together the full experience of the fleet, the Center and the design safety team of the manufacturer to solve pressing problems of that particular bird.

- Special conferences to launch all important industry programs — this year a new specification for introduction of design safety criteria into the original design and procurement procedures, so that safety can be designed and reliability built in initially! Early next year we will sponsor a



human factors symposium in order to spotlight the need for progress in this area, which produces the greater number of accidents but apparently receives the least overall attention.

- A movie program designed to bridge the educational gaps in our program, particularly with the younger generation who are maintaining our million dollar aircraft. These films are in production this month and will be released in 1964, if not sooner.

- Augmenting the excellent training and education program of the University of Southern California by providing a special 5-day safety course at the Center. This provides a broad but practical factors program for new aviation safety officers, and serves as a refresher and stimulus to more experienced officers. We are also seeking an increase in the senior command and staff officer safety course quota at USC.

"Thank you for coming here today and letting us tell the story of aviation safety in terms of people. For it is a story of people, their lives and their deaths. We have dedicated ourselves to cutting the fatal accident rate by at least 30 percent in the next two years; that is a saving of some 60 fellow pilots and aircrewmembers."

"This is a job we can do and must do, and we know we'll be able to count on your fullest partnership in this. You and other squadron skippers, can make or break the program by your efforts and your attitude."

"This program, and in fact all command, carries with it a challenge of leadership. You must insure that a vigorous program is pursued in your command on a continuing basis. This must be an all hands effort if it is to be effective. The prime mover is you, the C.O., assisted by your aviation safety officer. He is your strong right arm in safety matters."

"Be sure to give him freedom of action in carrying out his duties or you can become a prime problem instead of a prime mover. Be sure your safety officer has the status of a department head with direct access to you. You'll surely weaken your program if you assign him numerous collateral duties. His primary duty will take all his time and efforts and then some. The Aviation Safety Officer's Reference Manual, published by the Center, is your basic guide for an aggressive program."

"One more thing, gentlemen. As a souvenir of your visit, here's a package of information about the Navy's total safety program."

(For your special safety package, please see the following pages. — Ed.)





The heraldic description of the NASC insignia is as follows:

The gold wings of Naval Aviation are centered in the symbol representing smooth airflow over an aerodynamic surface and here equated with smooth flight.

In the quadrant of dark blue symbolizing the seas, are the trident of naval superiority and command; the torch of knowledge representing education, training and accident prevention measures; the modern wing symbolizing flight, present and future; and man

representing the human factor in aviation safety.

This composite is superimposed on a triangle of light blue which is representative of the skies where Naval Aviation operates throughout the world. The motto "Readiness Through Safety" summarizes the mission of the U. S. Naval Aviation Safety Center — "Our Product is Safety, Our Process is Education and Our Profit is Measured in the Preservation of Lives and Equipment and Increased Mission Readiness."

The Safety Package, Part I

For a fuller appreciation and insight
into **today's** program
apply the perspective of the past.



Yesterday

REMEMBER 1953? It was peacetime though Sixth Fleet units were earning the Occupation Medal. *Corsairs* were still around but jet fighters were in squadron service. That was the contrast.

As for progress, press releases fondly referred to the MIDWAY class as the Navy's new, "giant" carriers. Ground support in Korea as served up by *Skyraiders*, *Corsairs*, *Panthers*, and *Banshees* had nailed down a solid combat role for naval air and there was promise of more to come in blueprints stamped "secret." From the outside the organization looked airy, gaining speed and altitude.

Inside the structure, however, there were cracks — nothing that could be seen through the paint, but warning enough. The late Vice Admiral Flatley voiced the danger during 1953 at Pensacola. In blunt terms the message was this: The Navy could run out of aircraft if the number of crashes were not reduced.

Stripped of graphs and statistics the problem came to one of logistics. Every 10,000 flight hours five plus aircraft were involved in an accident. In 1953 there were 724 aircraft destroyed. With the existing budget and the price of new aircraft, climbing as fast as the jets themselves, there would be fewer and fewer replacements each year. It was financial hemorrhage. If you projected the situation far enough into the future there could come a point where naval air would expire for lack of combat aircraft.

Reducing accidents does a lot more than merely preserving a certain number of aircraft each year. An accident sets off a chain

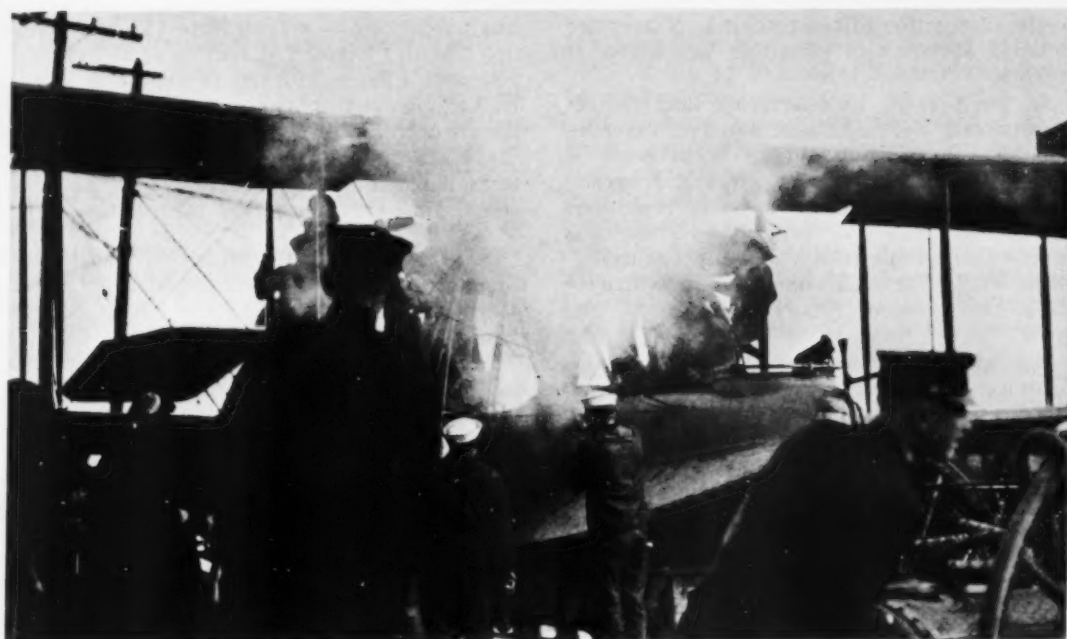
reaction. Immediately you have one less airplane to fight with. If it is destroyed there is the problem of replacement. Even if it was only damaged it has to be repaired. If it was a fatal accident another crew is needed. As the loss touches each link in the chain the whole structure is weakened.

The benefits of accident reduction are therefore obvious. In sheer numbers your combat potential is higher. Stem the number of fatal accidents and you have more experienced crews on hand, cutting down the training burden. The strain on repair facilities is also lessened.

There was no question that the middle 50's had to see an improvement in naval air's accident rate. The big question was "how?" Skeptics throughout the Navy proposed putting the airplanes in the hangar and locking the door. "If you fly 'em, you gotta accept losses," was their opinion. Others too wondered what could be done. There were occasional mistakes and goofs but after all, nobody goes out and deliberately has an accident. It was hard to believe that drastic action was suddenly needed.

What the individual could not appreciate was the pattern which emerged when accidents were totaled up. Perhaps once a year someone from his squadron or station would run out of gas and belly-in somewhere. At worst it seemed like an isolated instance and at best served as humor at the expense of the unfortunate pilot.

But during 1951 approximately 50 aircraft accidents were directly attributable to fuel



exhaustion. Of these 31 resulted in destruction of the airplane. An additional 12 suffered major damage. There were 5 fatal accidents and 4 with serious injuries. Very quickly this running out of gas is no longer a joke.

How could this happen to trained pilots? The reasons are varied but it gives a clue to the magnitude of the job facing anyone attempting to improve the situation. Fifteen pilots ran a tank dry and made a forced landing while fuel remained in another tank. Three accidents resulted from pilot, copilot and crew being strangely unconcerned and starting on their way without checking fuel. Ten accidents resulted from exhausting the fuel while lost.

Complacency and neglect are strong elements in these examples. If you were going to try to eliminate aircraft accidents it would be logical to start an attack here. The primary weapon would be education, running from the classroom to the mailed fist if necessary.

Using education to solve the problem would actually be nothing new. There has always been a concern about accidents and the traditional dependence on stopping them has been a combination of personal supervision and printed word. The pre-World War One

"Safety orders and regulations pertaining to the flying school" at Pensacola are a detailed work on how to avoid flight accidents. Nevertheless, during 1918 Pensacola had 148 crashes in 37,000 flight hours. A crash every 250 hours, a completely wrecked plane every 1208 hours, and a fatality every 3152 hours. In the last 10 months of the war, when training pressure became greatest, 18 naval aviators and students were killed in crashes. It is evident that documents and publications in themselves are not the total solution.

Another type of printed word, recording of accident data, appears to have been rather vague prior to 1920. The earliest preserved Navy aircraft accident report, written on one side of a small 5 x 6 card, is noted to have occurred on January 2, 1920. The details are sparse; limited to the fact that there were no injuries and that damage was confined to the keel fittings of a small flying boat. Name of the pilot was not included, nor was anything about the cause of the accident or recommendations on how to prevent a similar one.

Several accident reports later a few words on the "cause" of the accident begin to appear. The "remarks" are merely comments

on the disposition of the machine. Names are included only when personnel are killed or injured.

At the present time accurate accident reporting with detailed cause and recommendations for preventing similar occurrences is regarded as a strongpoint in the program. This lack of information in early reports is not due to secrecy or oversight. There was simply no real knowledge of what was useful. Even without a clear direction in which to steer, the accident report began to fill and grow.

By early 1922 a printed form is available. Although it was still a small card each heading did not have to be typed in. A new item also appeared: "Personnel in plane." From now on the pilot would be identified. Pilot time was added two years later, usually broken down between landplane and seaplane.

In 1926 the "cause" of the accident gets more attention with added details of the event. Occasionally there are recommendations for curing material failures.

A new form is in use by 1928 which modifies "personnel in plane" to "responsible pilot." One side of the form gives block spaces to be checked and on the reverse is a "summary of accident."

Pilot proficiency, an aspect of great interest today, is officially recognized in 1930 with the appearance of a heading "hours in type 3 previous months." By the late 30's the form is officially called a "Trouble Report (N. Aer. 339)" and has a space for "description of accident." It is appropriate for a pilot statement to be attached to the Trouble Report.

These cannot compare with 1963's Aircraft Accident Reports which run anywhere from a dozen to several dozen pages, but it must be assumed the old reports were effective. From 28 accidents per 10,000 flight hours in 1922 the black line on the rate chart drops steadily as the years march toward World War Two. In 1942 there were four accidents per 10,000 hours. It is almost as though the decrease is in proportion to the increasing length of the reports.

From the first, the accident data was used. In 1924 the Bureau of Aeronautics released an analysis of aircraft accidents occurring during 1920 and 1921. There were limited ways in which to call attention to soft spots in flight safety but the traditional method

was publication — a Tech Note (TN) or Aviation Circular Letter (ACL) in a semi-technical vein and a more informal presentation in the BuAer Newsletter (later to become "*Naval Aviation News*"). By 1942 there was a Flight Statistics and Safety Section within BuAer, responsible for collecting, analyzing, and disseminating aviation safety information.

In postwar years this function was transferred to the Office of the Chief of Naval Operations and was called the Flight Safety Branch.

The accelerated training of World War Two had naturally pushed the accident rate up and as could be expected it began to drop when the shooting war was over. However, the drop was not fast enough. Where an F3F-2 biplane fighter cost \$28,500 (flyaway Bethpage) in 1938, its 1950 counterpart ran to half a million and the 1953 cost was even higher. When the postwar aircraft accident bills came due there was immediate reaction — and action.

In 1951 the Flight Safety Branch had moved from Washington, D. C., to Norfolk, Virginia and was redesignated the Naval Aviation Safety Activity. All the machinery for accident prevention was in existence but now we know there was not enough analyzing and disseminating of accident information — the organization was primarily limited to record keeping and statistics.

An overnight change did not take place but there was a change.

Each squadron organization chart contained a space for an "aviation safety officer." In theory an experienced aviator — his was the task of local accident prevention and if a crash was not prevented, it was also his task to participate in the subsequent investigation and report in writing. Generally his talent in this field was acquired by frequent and direct on-the-job training — limiting the time available for direct and original accident prevention.

In some respects this was highly unsatisfactory. The quality of work, whether prevention activity or accident reporting, varied greatly. There were too many accidents labeled "cause undetermined."

To plug this gap, a Naval Aviation Safety Officer course was established at the University of Southern California for training squadron safety officers. A team of crash investi-

gators was gathered at the Safety Activity, their mission was to assist squadron safety officers in reducing the number of those "undetermined" crashes; to go a little further and find out "why."

Publications too, began to alter. Formerly the principal publication leaving the Safety Activity leaned toward a mere tabulation of the past week's major accidents. Now more discussion and details of various types of accidents began to be added. Then the Weekly Summary of Aircraft Accidents was split off as a separate publication aimed at commanding officers while the "Safety Bulletin" became more of an information pamphlet for pilots; the forerunner of APPROACH magazine, which blossomed forth in July 1955.

The two objectives of these changes were basic. More detailed and accurate accident reporting meant better prevention information. As you get information in, put it together and send it right back out to squadrons. But neither would do any good unless a third objective was satisfied — *awareness of the situation at squadron level.*

Forthwith, personnel from the Safety Activity became traveling men from time to time. They headed out to pass the word to groups of skippers and safety officers in every major command.

With the facts and figures laid out clearly it was a shock treatment for most of the audiences since they were generally unaware of the problem of naval air as an entity. The individual may have felt as if a comfortably distant forest fire was suddenly threatening to burn the roof from over his head.

It all hinged on the question of who became most responsible for reducing accidents once the route to the objective had been pointed out. The answer was elementary — if the skipper got credit for a good job, then he must also take credit for his accident rate.

Military blackmail? Perhaps. However, messages, letters and regulations concerning aviation safety had been blown down from high places in a small blizzard of paper without significant effect.

Paperwork is useful but by itself does not win battles, else there would be no defeated admirals. Success lies in the actions of the men who actually do the job. And whether it be pushing a throttle or turning a wrench,

the squadron commander is closest to these men. It was up to him, as it has always been, to produce results.

If we were to deal with the years of naval aviation safety story as chapters in a book we could say chapter 1953 was a year of awakening; the next chapter, '54, a year of awareness.

Chapter 1955 was the year of results. The number of accidents took a tumble downward. The line marking the rate has continued to dip lower each year but '55 was the big one. It was proof that accidents *could* be prevented.

Who could take credit for it? In an organization as great and complex as naval air there could only be contributors. No one individual or group could be singled out. There were many success stories.

One story concerns the Naval Aviation Safety Center; in early 1955 it had been changed from an "activity" to a "center." It's a small outfit, a little over a hundred people. The annual budget runs near the price of an F-8 jet engine. It maneuvers no ships or aircraft and writes no directives. What part did, or could it play in the efforts of flight safety?

Behind the simple name change lay an enlarged mission and increased responsibility that begins to run like a continuous thread through the greater game of air exercises and fleet movements.

The Safety Center is many things to many people. It is middleman, switchboard, sleuth, statistician, educator and orator.

Where there is a laxness in correcting an equipment deficiency it was a burr under the saddle. At the scene of a puzzling crash, it took the shape of a trained accident investigator who had no other task than to find the cause. For the man with a question or suggestion it was a source of information or action. The man who made a mistake could tell about it through "Anymouse." And for the squadron Aviation Safety Officer the Center provided rapid accident prevention information on his particular model aircraft whenever it occurred.

The chapter called 1963 has been a good one but it will not end the book. People still run out of fuel, still button up a cowling with a linkage hanging free. So it must be said of the naval aviation safety story: To be continued . . .

The Safety Package, Part II

From the annals of history and an eye to the future, Safety IS . . .

Today

SHORTLY after Orville and Wilbur grew tired of conventional land travel and tried the bird method, American aviation (private, commercial and military) grew by leaps and bounds.

Now, when people become airborne they enter a somewhat unnatural element and they become terribly dependent on the proper functioning of two things: Human capabilities and mechanical reliability. Since successful flight is dependent on these two factors, it is only logical to deduce that the malfunction of either or both of these things may result in an aviation mishap. The first such breakdown in this companionship was recorded in mythology when Icarus flew too close to the sun and melted his wings. Naval aviation suffered its first fatality in June 1913 near Annapolis when ENS W. D. Billingsley was thrown from his plane, a Wright B-2, and fell 1600 feet to his death.

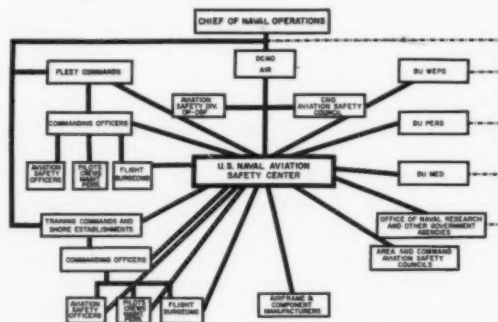
The best way to prevent accidents, once we've built a reasonably good airplane and trained a capable pilot and crew, is to be able to find out quickly what things can cause the airplane or pilot to set up an accident situation. For this we need to get hold of accurate information to analyze it, to obtain a proper answer, and then get the word out to those who need to know.

Whatever you call this process, the problem is essentially one of analysis and then of communication. To provide this process in naval aviation, there was developed and incorporated into the system an aviation safety organization. (Re SecNav Note 5450 ser 441 and BuWeps Inst 5451.116A). Let's see how it works for you.

One thing should be made quite clear before we proceed. No safety organization can

any more make aviation safety than a computer can exercise sound judgment. Any decrease in the accident rate or loss of life and property is a direct result of you, the operators. *Your* safety record depends on *your* safety program and *your* safety efforts. With this statement firmly in mind, let's explore the Navy's safety program and organization today.

The Naval Aviation Safety Center is the melting pot for aviation safety problems, ideas and solutions. We operate on a basic concept that if post-accident study can solve accidents, then pre-accident study can prevent them! The Center is in the direct chain of command with the office of the Chief of Naval Operations and has direct liaison with the operational units, type commanders, other Navy bureaus and manufacturers. Information is also exchanged with other branches of the Armed Forces. Our representative with the USAF is Commander N. R. Quiel at the Directorate of Aerospace Safety, Norton Air Force Base, California. The Army Accident Research Board at Fort Rucker, Alabama, has assigned a senior Army aviator, Major F. E. Stewart, USA, to the Center.



Internally, the Center is organized on a similar basis as the normal operating units. We have gathered here a group of people with various backgrounds and specialties, whose experience and qualifications contribute to the numerous projects in which we become involved. There are flight surgeons, doctors of psychology, aeronautical engineers, pilots of almost every model of Navy aircraft and aviation maintenance personnel, to mention a few.

Of course in an organization the size of NASC (approximately 150 people) there is an

increased need for executive control and coordination of the rather diverse department functions. These functions are handled by an executive department including Captain T. J. Ball, Chief of Staff, Commander C. W. McKee, Plans Officer and Commander R. F. Hogue, Project Coordinator. Administrative support is provided by a department headed by Lieutenant Commander G. P. Barnett.

To get the inside story on this nerve center of naval aviation safety, follow along on a tour of the various departments.

Accident Investigation

Department Head: LTCOL R. S. Hemstad, USMC

When the initial notification of an aircraft accident is received a decision is made whether or not to send our investigators to the scene to conduct a parallel investigation. The Center does not go to the scene of all aircraft accidents.

During fiscal year '63, the Center investigated 63 accidents for an average of 15 investigations per man. Each trip takes from a few days to several weeks so you can see that it is necessary to send them on only those accidents of particular significance. During fiscal year '63 the investigations involved 21 different aircraft models. Continued training of department personnel at various schools really keeps these gents on the road. By the way, this is shore (?) duty.

Which ones do we investigate? This depends on the nature and the severity of the mishap. Almost all of the new fleet aircraft get priority if there is the possibility of discovering design or manufacturing deficiencies which may save other aircraft of that breed. Fatal accidents, which do not yield a ready solution, also get a look-see and of course any accident which may cause a good deal of publicity.

The reports of our investigators are the basis for a number of valuable recommendations regarding techniques, equipment, and facilities. We have a saying around here that, "no aircraft accident is a complete loss if from it something can be learned which will help prevent other accidents." Speaking of pre-



venting accidents, if we can aid you in preventing just one accident, we have more than paid for an entire year's operation of the Center.

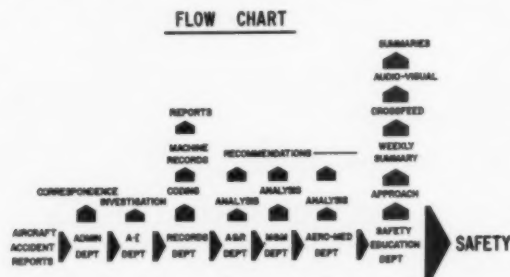
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Records and Statistics

Department Head: CDR W. H. Hile

After the mishap comes the report. When the Records Department receives these reports, they code them and put all pertinent information on IBM cards for quick sorting. AARs are kept on file about two years after which they are microfilmed then sent to a

more permanent storage site. Although kept on file, reports gather little dust. The other departments in the Center use these to cull out problem areas and make trend analyses to guide future Center activities. In this Department for instance, the information contained in these reports is used to keep an eye on the accident rate and prepare statistical data for the answering of individual inquiries, annual CNO safety awards and for the preparation of various local and Navywide aviation safety presentations. You may have seen some of the statistical publications which are generated from this Department. The classified U. S. Navy Aircraft Accident Statistics are prepared semiannually on a calendar and fiscal year basis to provide a summary or how-goes-it for staff and squadron information.



Maintenance and Material

Department Head: CDR D. M. Layton

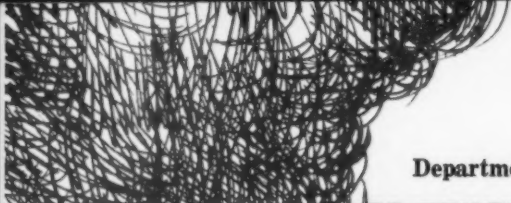


Our M&M people are all experts in the field of aviation maintenance. They have spent many years in the fleet prior to this duty and are thoroughly familiar with the problems and operating conditions of the squadron mech. In their present billets this experience is put to work in merging the concepts and designs of hardware manufacturers with the capabilities of the fleet units to ensure a low percentage of maintenance caused accidents.

In this department you'll find that the Aircraft Accident Report information is supplemented by dope from other sources, such as Incident Reports, FURs and daily message traffic. All of these are carefully considered both for individual significance and for indications of possible patterns which might offer more answers. Often, items which appear rather isolated to a flight activity may become significant in the light of the whole file or case regarding that subject.

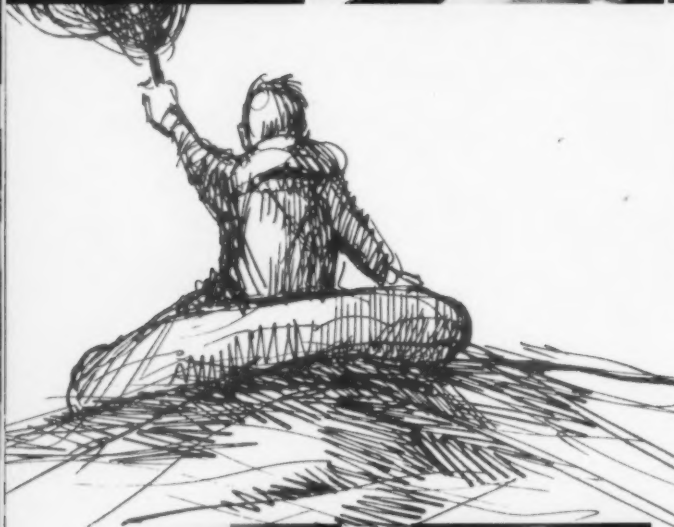
Armed with these facts, data, and suggestions, a biweekly liaison visit is made to BuWeps to discuss possible solutions to the various problems.





Aero-Medical

Department Head: CAPT E. L. deWilton, MC



Around the corner we change from a nuts and bolts atmosphere to one of pills, band-aids and the couch. This is the Aero-Medical Department where specialists are probing into what is probably the most unexploited source of aircraft accident prevention — the human factor. Here, personal safety and survival equipment is evaluated in the light of all recorded experience, and painstaking studies are made of that most unpredictable factor of all — the human mind and body.

Like all the other departments, the aviation medicine folks work closely with the various bureaus and commands which develop, test and procure new equipment and procedures. In fact, a considerable amount of information is obtained from their personal contact with fleet people.

Then, too, they attend as many planning, mockup and equipment conferences as workloads permit. Primarily, they attempt to observe the whole naval aviation scene from the viewpoint that most of the really big problems of aircraft accident prevention have their answers in 'people' troubles. This department also has a full time writer to submit material to *APPROACH* and "Crossfeed." This has worked so well that it may be adopted by other departments in the Center.

Analysis and Research

Department Head: CDR F. T. Rooney

As mentioned before, various departments use the AARs and other reports to obtain data and compile information to aid in the various projects we become involved in. The Analysis and Research Department is analogous to the operations department of the squadron. It is made up of analysts for every model fleet aircraft. These people monitor the health and welfare of their respective aircraft models with a knowingness which, in many cases, comes from personal flight experience with the airplane. This is a sort of clearing house for information coming from the operating squadrons, the manufacturers, the bureaus and from individuals. All the information collected and processed by the various departments is weighed for effective application to the cockpit situation.

When operating problems arise with an F-4, for example, this analyst is consulted, studies the situation with others at the Center, such as material experts in the Maintenance and Material Department, and makes a recommendation for the solution of the problem. Each analyst reviews the AARs and incident reports for his particular aircraft with the hope of finding some method to eliminate a particular hazardous operating situation or procedure. Over a period of time a trend analysis can be made which may enable a timely recommendation to arrest a potential mishap. Although not directly responsible or authorized for making aircraft or operational changes, their recommendations, submitted to the appropriate bureaus or commands carry considerable influence due to this operational background.



In addition, this department has a facilities division which deals directly with the ship/shore operating environment (catapults, arresting gear, CCA, GCA, field arresting gear, lighting . . .).

Safety Education

Department Head: CDR T. A. Williamson, Jr.

In this wing of the building we have the voice of Naval Aviation Safety. The Safety Education Department is responsible for the production of all the official Center publications and literature. Among our inventory are the "Weekly Summary," "Crossfeed," APPROACH, special summaries and various posters. We have in the past produced tape-slide (audio-visual) presentations and have in production three safety motion pictures.

This is where the results of much of the work of the other departments are gathered together in packages of good dope. "Crossfeed," for example, is the combined effort of all the departments, each providing material on their own particular bailiwick. The material contained in this bulletin is intended directly for the user; operating tips, information on new equipment and the like.

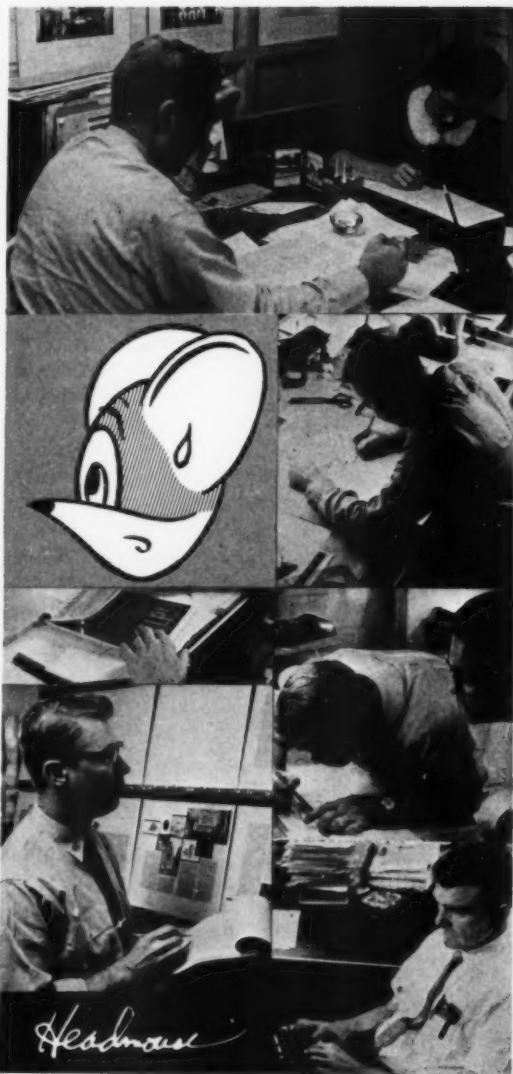
"Weekly Summary" is a sort of command briefing and generally contains material pertinent to the skipper. There's also good info for pilots and the ASO will find its a big help in his safety program.

APPROACH should be a familiar rag to all hands. This publication contains articles, notes, and personal accounts which should be of interest to all of our quarter of a million readers. The magazine is divided into three areas and provides timely dissemination of information in the fields of flight operations, aero-medicine and maintenance. We print 25,000 copies every month or one for every 10 readers; thence our plea: "Pass this copy along to another shipmate. The accident you prevent may be his!"

This brief tour of the Center has shown the primary course of action toward making your job safer.

Other things, such as field trips, conferences and manufacturers' safety symposiums, make up our extracurricular activities that give us a chance to renew professional contacts in the field and to cross-check development with other services as well as with such organizations as NASA.

Briefly, we try to be a link between the people with the problems and the people who can provide the answers. We help further by



providing followup support for this effort.

The solution is usually the final product of a lot of work and a lot of thought by a lot of separate agencies, commands and individuals whose chief bond is their concern about making aviation safer and hence more effective with respect to mission-readiness.

It is often said that "effectiveness is measured by results."

Progress Report

AS you can see from the graph below the accident rate per 10,000 flight hours has dropped from 5.4 in 1951 to the present rate of 1.46. It can only be conjecture here, but it is felt that this drop has been influenced by our efforts. It would be impossible to chronicle the sum total of accomplishments of the safety program, for we will never know. But we can say that the Center and the safety program in general has stimulated a great many items . . . just some of which are Navy-wide recognition of the impact of accidents, establishment of the replacement pilot training program, detecting incipient engine failures through the use of the chip detector and other engine reliability programs, retrofit of low level ejection capability seats in all first line aircraft, reduction of wheels-up landings, utilization of field arresting gear. The establishment of the incident reporting system, which due to the relatively infrequent number of major accident reports, now provides the

Center with a more extensive flow of research information on operational, maintenance and equipment problems. Most industry experts now agree that full reporting of incidents can tell us more, sooner than the bulk of accidents.

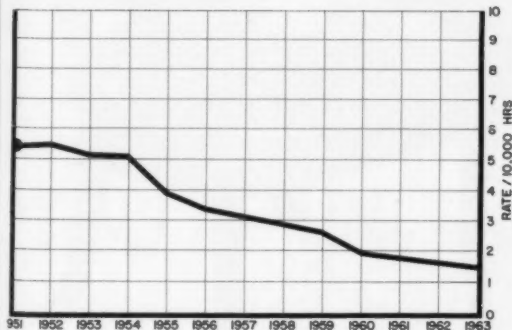
If the 1955 rate had continued unchecked, with the rising cost of today's aircraft, the annual cost of accidents would be threefold! 1954 marks the real beginning of the downward trend. At this time the Center was enlarged and the program expanded. As you can see the curve now is becoming *flat*. As we reach new lows in our accident rate it becomes harder to lower it.

A look at a chart showing dollar loss in aircraft accidents shows another picture. The dollar loss was cut to a low in 1951 while the accident rate was near its peak. Of course, the higher dollar loss is directly attributed to greatly increased cost of our modern aircraft.

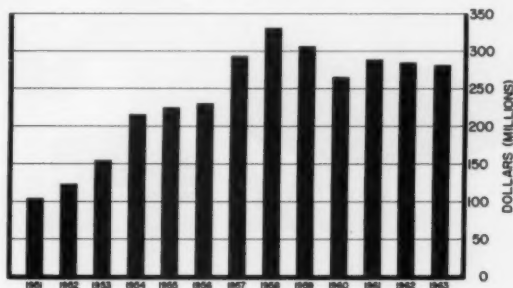
The next chart points up more dramatically what our program is accomplishing. During

17

ALL NAVY AIRCRAFT ACCIDENT RATE
FISCAL YEARS 1951-1963



DOLLAR LOSS IN AIRCRAFT ACCIDENTS
FISCAL YEARS 1951-63



fiscal year 1963 we had a total dollar loss of 281 million dollars. If we project this figure back to the fiscal year 1954 accident rate, for example, we would have had 1796 accidents in fiscal year 1963 instead of 514 and dollar losses would have closely approach *one billion dol-*

lars. This should drive home the importance of an aggressive accident-prevention program. You can see the real value of an all-out effort when you understand that, a reduction of only .01 in the aircraft accident rate could save two lives and nearly three million dollars.

"To sum up, gentlemen..."



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A successful safety program seeks to identify and eliminate hazards wherever they may be found in a unit's operations. Efficiency and safety will result from properly trained and equipped people, following clear instructions, using the best known procedures, under competent, persistent supervision, in an atmosphere of vigorous, determined command.

Keep in mind that safety is not an end in itself, but a high state of readiness characterized by accident-free operations.

Please don't get the impression the Center is taking all the credit for this impressive record. It was achieved only by the efforts of all concerned with naval aviation.

So, it brings it right into your own cockpit. Anything and everything you can do to help lower that rate is measurably increasing *your personal safety*.

Since *you* really are the key to this whole program, here are some things you can do to help us help you.

- Of primary importance is your desire. No amount of preaching, rules and regulations can make you a safe operator unless you want to be one. Remember, it's you that is involved when the trouble comes.

- Assuming you now have the desire, the next step is to develop your actions to reflect professionalism. Being a professional does not mean you have to remove all the fun from flying, only the foolishness.

- Once a professional attitude is assumed, the program can really get rolling. Since this job is one of communications, it becomes necessary to hear from your end of the line. It's your problems that we are to solve, so you are the ones who have to ask the questions and furnish the facts. Since we also try to solve other people's problems, we appreciate all the help you can give in the way of answers, ideas and suggestions. Whether these ideas come in the form of letters, Anymice or feature stories — we need them all.

19

How do You fit into the picture?"

Search for Searcher



20

It was to be a Search and Rescue operation. Two UH-25Bs, were to be used. We received a briefing by CIC at 0530 that morning, and were to be launched at 0600. The briefing consisted of the search pattern to be used. We were told that we were to be under positive radar control at all times. We were to search at 250-yard intervals on each side of the ship five miles forward and five miles aft of the ship. We then manned our aircraft.

After takeoff, I switched to control frequency, and established a radio check. The ship's heading was 120 degrees, and I paralleled this course on the port side. I received no instructions, so I called Ship Control to as-

certain my instructions. There seemed to be some confusion as to which plane was which, so they asked me to turn left to 050 degrees for radar identification. They then had me vector 341 degrees and I saw the ship and reported my position as five miles off the port bow. I continued on course 341 and then received, "Angel—, I do not hold you on my gadget. What is your position?" I replied that I didn't have the ship in sight, but that I should be off the port quarter. However, the ship had changed course. Not knowing this, I was at this point lost.

I climbed to 2000 feet hoping to be able to see the ship. There was a stratus layer at around 700 feet, so I saw nothing. I be-

gan a left-hand orbit and informed Control of this. They were still unable to make contact with me and requested I squawk 377. I did this, but apparently my IFF was inoperative. I then noticed an island off to my left about 20 miles and informed Control of this. They said that it should be San Clemente, and told me to vector 190 degrees to the ship. This I did.

I was getting very concerned at this point because my fuel state was down to about 45 minutes to red light. I descended to 500 feet to get below the fog bank, and continued on course 190. Around 10 minutes later (after receiving no additional instructions), I called up Control and asked if they held me



The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. As the name indicates these reports need not be signed. Forms for writing Anymouse Reports and mailing envelopes are available in ready-rooms and line shacks. All reports are considered for appropriate action.

— REPORT AN INCIDENT, PREVENT AN ACCIDENT —

approach/december 1963

on their gadget, I received no answer; so climbed to 1500 feet to see if I could obtain radio contact. I made contact with my playmate, but lost communications with him before he could relay any message to me. I then decided to try and make San Clemente Island, and reversed my course. At this point, I had about 45 minutes of fuel remaining. I then received another aircraft calling me, and established communications with him. I told him my intentions, and he relayed them to the ship and was to escort me to the island. I had decreased my RPM to 2100 (minimum for flight), and proceeded in the direction I thought San Clemente to be, at 500 feet. I spotted the mountain on the island and informed my escort of such, who in turn relayed to the ship. I passed over a DD which was working with the carrier, and recognized it. I informed my escort of this. My escort said the ship informed him that the DD was 15 miles south of San Clemente. I concurred with this. My escort spotted me and flew my port side until I had safely landed at the nearest available landing area on San Clemente.

I was indicating 20 pounds of fuel remaining when I landed. My escort informed me that fuel would be brought to me by helo, and for me to ascertain a good landing area. I rogered this and shut down. About two hours later another aircraft arrived and escorted me to the ship.

Fouled Fluid

'Twas a bright sunny Monday morning—just perfect for a shake - the - weekend - weeds - out type hop. The T-28B taxied normally and flew perfectly. I returned to the field for a land-

ing and demonstrated a short field landing to the aerial observer in the rear cockpit.

I taxied around for takeoff, made a 30-inch mag check and received tower clearance for takeoff. When I taxied to the end of the runway and applied brakes to turn around, lo and behold, no brakes—pedals bottomed. With engine secured and canopy opened the aircraft bounced helplessly down the gradient at the end of the runway. *No damage—whew!!*

Ten days later with brake units replaced, bled, and aircraft signed off for test hop, I dupli-



cated the short field landing and obtained the same results but this time the brakes were controllable using pumping action.

After lots of head scratching in the maintenance department, the brake system was entirely bled and a milky white substance appeared. With all the hydraulic fluid replaced the flight was again duplicated and the brakes held.

Maintenance experimented with *engine oil and hydraulic fluid* and obtained a mixture similar to that removed from the system. Upon checking past flight records, it was discovered that this aircraft had made a cross-country the hop prior to the first brake failure.

Another Tape Caper

While enroute to the exercise area in an SP-2E aircraft for a routine ASW exercise, it was discovered that the take-up reel on the UNH-6 tape recorder was not on board. This seemed to be a minor problem because an extra reel of ¼ inch magnetic tape was carried.

It was decided to unreel the extra full reel to provide the needed take-up reel. Unreeling the tape on the flight deck seemed too slow and cumbersome, so the second technician carried it to the after station. There he inserted the pencil into the hole in the center of the reel and threw the end of the tape out the after station hatch. The slipstream caused the reel to unwind at such a high RPM that the reel virtually disintegrated. Two of the men in the after station received injuries from bits of the plastic reel.

A flight surgeon was on board as an observer and provided first aid to the injured men. The second technician received a cut on the left cheekbone and small cuts in the groin. The ordnanceman received a four-inch cut on the right leg which later required nine stitches to close. The PPC aborted the flight in order that the injured men could be returned to the NAS for treatment.

A note on protective flight clothing. The ordnanceman avoided serious injury to his right foot by wearing his steel-toed flight boots. A fragment of the plastic peeled the leather from the toe of the boot and dented the steel.

This incident could have been avoided by proper preflight to insure availability of a take-up reel and by informing all crewmembers of the danger inherent in this type of practice. ●



RADAR ALTIMETER REPORT

Dear Headmouse:

I have four easy questions and one very difficult one.

22

(1) Q. Which aircraft are most commonly seen on carriers in the fleet?

A. A-5, A-4, A-3, A-1, F-8, F-4, F-3, C-1, E-1, S-3.

(2) Q. Which of the above are most numerous?

A. A-4.

(3) Q. Which of the above have radar or radio altimeters?

A. A-5, A-3, A-1, F-8, F-4, F-3, C-1, E-1, S-2, plus numerous obsolescent, obsolete, war surplus and junked aircraft.

(4) Q. Which of the aircraft in question one do not have radio or radar altimeters?

A. Only the A-4s.

(5) Q. Why in hell don't they???

A. ???

ANYMOUSE

► This question has been asked by almost every *Skyhawk* driver for the past 5 years.

During a recent liaison visit to BuWeps, it was learned that the AN/APN 141 radar altimeter is scheduled to be installed in the A-4, F-8, and F-4. Douglas Aircraft is now accepting the al-

timeters for the A-4 and the units are being shipped to BuWeps-RepLant and Pac for distribution.

It was further learned from BuWepsRepLant that the total order to date (27 Aug 63) was 150 with 72 allocated to each coast.

Contact ComNavAirPac for specifics as to when and to whom they will be given on the west coast.

Very resp'y,

Re Full Pressure Suit

Dear Headmouse:

Re your article on the full pressure suit in the November issue, here is an informal account of an experience I had in 1961. Details recalled at this late date are to the best of my knowledge.

Our mission was briefed to be a practice profile of a typical leg anticipated in the cross-country Bendix Trophy Race to be conducted in May, 1962. Both of us were wearing full pressure suits as the flight would be conducted in part above 50,000 feet. Takeoff was made in afterburner and a climb was made to 36,000 feet. During this climb we discovered that the cockpit pressurization system was inoperative. It was decided that the flight profile would be pursued in spite of this failure as long as the pressure suits functioned properly. The climb was carried to about 56,000 feet where a supersonic cruise was maintained for about eight minutes.

The pressure suits functioned exactly as advertised with pressurization of the suit itself commencing on the climb as we passed 35,000 feet. At 56,000 feet the pressure inside the suit was sufficient to maintain the suit altitude at 35,000 feet. (We monitored this suit altitude by reference to the altimeter installed on the left leg of the suit.) The suit flexibility, of course, was affected somewhat by the ballooning of the arms, torso, and legs, but we had experienced this in the low pressure chamber demonstrations and it by no means restricted us in our ability to follow our profile. Following the cruise portion of the profile, we made a descent to about 33,000 feet and accomplished an aerial refueling from an A-3B tanker. Remainder of the flight was uneventful.

ANYMOUSE

► Good Show! Headmouse takes great pleasure in passing this info along.

Very resp'y,

Frequency Changes

Dear Headmouse:

Again a situation has come to my attention which has occurred several times in the past with other naval

The higher the cost of the aircraft--the

approach/deceMBER 1963

Have you a question? Send it to Headmouse, U.S. Naval Aviation Safety Center, Norfolk 11, Virginia. He'll do his best to help.



activities.

On 1 August 1963 the frequency (channel) of NAS_____tacan was changed from one channel to another. Concurrently the FLIP Enroute Supplement, and Enroute Low Altitude Chart dated 25 July 1963, and the FLIP High Altitude Terminal Chart dated 1 August 1963 still list the original channel.

Even though the change is published by NOTAM there is certainly a great chance that someone will not get the word. An accident could be the result or at the very least some very anxious moments.

It would seem that very little forethought and planning would be required to coordinate the changing of frequencies and/or approach procedures to be effective at the time new publications are issued and not 30 days or more prior to the change appearing in FLIP documents.

SAFETY OFFICER VRF-32

►Your point is well taken. This would be the ideal way to effect a change; however, it should not be a requirement imposed on the facility if operational necessity dictates otherwise. One of the prime functions of the NOTAM system is to disseminate timely information of

this nature and all aviators should keep abreast of this system.

Of course, there is always that two percent who don't get the word.

Very resp'y,

Headmouse

Raft Release Rift

Dear Headmouse:

In accordance with ComNavAir-Lant 311715Z of March 1962 all immersion actuators were disconnected from the wing life raft release system on the SP-2E/F.

Do you know if anything has been done to correct the difficulties in the system?

LT J. O. WICKE, VP-30

►BuWeps advises that the fix proposed by one O&R is unacceptable—that is, the relocation of the salt water submersion switch and associated wiring from the nose wheel well to the

lower radome. They feel that to be effective, the automatic life raft release mechanism should incorporate a fail-safe feature by employing two separate steps that must be actuated independently before the raft is released automatically.

Naval Air Engineering Center is presently working toward a solution on that basis. From all indications, it appears that the fix will not be available in the immediate future.

Upon receipt of the results of the investigation, BuWeps will promulgate corrective action to be taken. Until that time, the immersion actuator will remain disconnected and the manual release system will be the primary method of releasing the raft.

Very resp'y,

Headmouse

BACSEB Listing

►Here's more information on the Anymouse letter in the October issue of APPROACH concerning a possible listing of current and cancelled BACSEBs.

The Bureau of Naval Weapons advises that "The BACSEB system has been superseded by the letter directive system outlined in BuWeps Instruction 5215.8 dated 30 Jan 63 and there-

fore all new directives will be carried as Clothing and Survival Equipment Bulletins. The subject of filing these bulletins is now under consideration and will be included in an instruction now in preparation."

As further recommended by BuWeps, pending completion of the change-over to the new directive sys-

tem, the Naval Aviation Safety Center is updating a listing of current BACSEBs divided into subject groupings which was originated by CNAVVanTra. This listing is being sent out with Personal/Survival Equipment Crossfeed.

Very resp'y,

Headmouse

more important SAFETY becomes ...

approach / december 1963

'Flesh Freezes Solid in 30 Seconds'

By Carl Mydans

In the Arctic the wind is feared more than the temperature. You seldom hear the temperature given without the wind velocity, for together they form the "chill factor." This is a calculation which expresses the fact that the danger to the body at any given temperature is dramatically increased by each additional knot of wind. In each installation the day begins with an announcement over the address system: "Attention please. The temperature this morning is -15° . The wind 15 knots. The chill factor is -42° ." This means that going outside under these conditions would be the same as stepping into -42° cold when there is no wind. Everybody knows by heart the 30-30-30 rule: at -30° with a 30-knot wind, exposed flesh freezes solid in 30 seconds.

This danger is first brought home to all newly arrived military personnel—and the contractor civilians who maintain the equipment—in a vivid lecture and demonstration. "Sometime soon after that," a safety officer told me, "the new men get a rap on their BOQ door and are told to report dressed for flight. They find themselves in a truck, with at least one experienced man, driven outside the post. 'You've just survived a crash,' we

tell them. 'If all goes well, help will reach you by morning—if you survive the night.'

"For a moment or two some of them show something that looks like fright. In those temperatures and with that wind they know this is no game. We take off and they begin to function. They've been instructed. There's a saw in their survival kit. They saw into the snow, working slowly. It's hard snow, and if they work too fast they perspire—and freeze. So they take each snow block out carefully. It's tricky but they form the blocks into a roof. Sometimes it takes hours. Then comes an act that takes will power: they must undress down to their underwear, get into their sleeping bags and take their clothes and shoes in with them. The bag is effective only when it's in contact with their body heat. There's a great temptation to pass up this step. But by then the situation is so real and threatening that they follow the instructions desperately.

"We've never lost a man in this drill, though for every one of them it's a night to remember. After that they know they can survive when the real thing comes. It's fear and indecision and hysterics which kill a man out here." —*Life* ●



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From vintage issues of Approach herewith is presented a Christmas
Package for your reading pleasure —

Welcome Aboard, St. Nick!

Pretty well buried, we suspect, beneath the tremendous mass of prose and poetry generated each year on the subject of Christmas, there's a bit of unexploited information which seems to be of particular interest to our readers.

It has to do with a not-too-well-known aspect of the original St. Nicholas—not, mind you, the jolly old St. Nick of the “Night Before Christmas,” but the interesting and devoted man who, during the Third Century, traveled abroad considerably from his home in Asia Minor to become a legend and eventually a saint.

What isn't too widely known is the fact that St. Nicholas was regarded throughout most of Europe as a patron saint of the *seafaring man*, with many accounts recorded of his protective influence over the voyagers of the ocean highways.

And because the men who comprise naval aviation are but seafarers of the sky oceans, it is but a simple and natural transition to extend the realm of St. Nicholas to the airways and those who travel there.

Oh, we recognize that Mister Average Aviator tends to snort and fidget uncomfortably at any at-

tempt to associate, directly, his profession with things spiritual — he just doesn't care to discuss these things. We're just as certain that there are no atheists in cockpits, nor breathes there any pilot beyond the solo stage who has not at one time or another marveled at the Something or Somebody that prevented his buying the farm when the down payment had already been made in the form of a pilot booboo.

While we don't endorse the philosophy of the fabled carrier pilot who, on being launched, two-blocked the throttle, folded his arms confidently over his chest, and on reaching 500 feet said: “Okay, God, I have it!”, we do offer our small Thought for Christmas as a rather pleasant reminder that one of the outstanding figures of Christmas-time is a plankowner member of the seafarers' union of which we are a part.

Which fact, assisted by a reasonable amount of Planning, Procedure and Pilot Technique in *your* flight operations, should make for a merrier Christmas this year and in the future.

P.S.: to our most recently reported member . . . Welcome Aboard, St. Nick.





THE
RIME
OF
THE

Ancient Mariner

An ancient P-Boat pilot meeteth three staff members bidden to a conference and detaineth one.

It is an ancient P-Boat Pilot,
And he stoppeth one of three.
"By thy long grey beard and glittering eye,
Now wherefore stoppest thou me?"

"The conference doors are opened wide,
And I am next to speak
The staff are met, the agenda set
'Tis aircraft safety we seek."

He holds him with his skinny hand
"There was a ship, a Mariner," quoth he.
"Hold Off! Unhand me, greybeard loon!
Else with my briefcase I smite thee!"

He holds him with his glittering eye,
The Commander must needs stand still
And listens like a simple Navcad
The P-Boat Pilot hath his will.

The Commander moved to the coffee bar:
He cannot choose but hear;
And then spake on that ancient man
That bright-eyed Mariner pilot.

" 'Twas daylight when we cleared the ramp
On a night bounce hop, you see
A pilot for drill on the left side
And I in the right seat, PPC."

The ship was veered, the seadrome cleared
And round and round it flew
All in a black coal hopper sky
With a moon to aid the view

And far below some lights did show
But those in charge of lumination
Were as idle as a painted crew
Upon a painted station

But Hark! A coxwain, lighting buoys,
Does check the inner seawall light
And though the starboard one shows red
Its green-lens'd mate he cannot sight.

Straightway he reports the missing orb,
The Dispatcher passed to Station Ops
And they had done a hellish thing
In buck passing it was tops.

From man to man the warning passed
Nor ever did the Duty Officer get the word
Of a pattern of light no longer right
And the Tower of course never heard.

"Final landing now complete
The shoreline to the left
And the flickering Aldis lamp went out
Of light we were bereft."

AirPac save thee, ancient *Mariner*!
From the peril the dark doth hide
Why lookest thou so, you cannot see
A seawall awash beneath the tide.

The Aldis lamp begins to work
And the sight compels a clutch
"There, dead ahead, Oh Lord
Rocks, and blocks and such.

"Betrayed by lights we'd turned too soon
But the cause I mourn aloof
Around my neck the blame is hung
The PPC must assume the goof.

"Water, water, everywhere,
Except beneath our keel.
Are those her ribs through which the moon
Does peer where the skin is peeled?

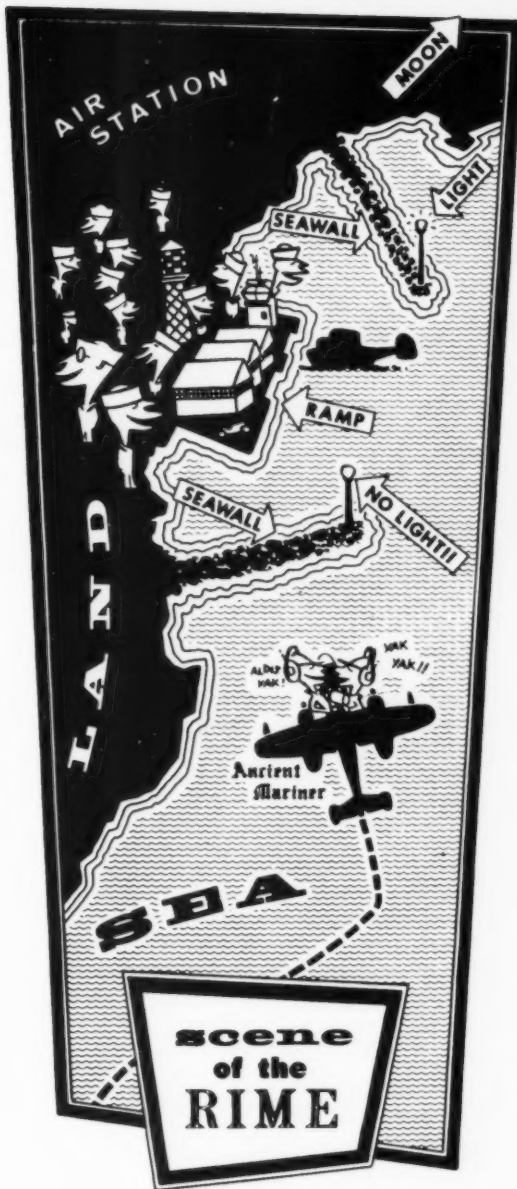
"I looked upon the bashed-in hull
But or ever a prayer had gusht
A wicked whisper: 'AAR'
Made my heart as dry as dust.

"I fear thee, ancient Yoke-Boater!
And thy causes secondary!"
"Be calm, thou quaking staff man
No long green table needst thou worry.

During the flight, as darkness falleth, the seadrome light tenders faileth, one and another, to replace a seawall entrance light.

Deceived by the altered light pattern, the *Mariner* runneth aground on its ramp approach.

The staff-brass scoffeth the plea of the pilot, who bemoaneth the cause of his misery.



"Farewell, farewell, but this I tell
All outfits great and small
He fareth well who worketh well
And gets the word to all!"

The Commander goes like one fair stunned
And moans "These tales are such a bore,
Why do these characters always pick me?
I should have stood in the Chaplain's Corps!"

Presented here is a free translation of a hieroglyphic-inscribed fragment of papyrus recently uncovered by archaeologists probing the secrets of a previously undiscovered tomb-vault bearing the symbol "BuSlaves—No Admittance Except to Authorized Pharaohs." The exact date of the writing is unknown, but the vault is believed to have been constructed during the dynasty of a little-known ruler named Comfairwestpacjap.

Cantedeck Tales

AND so it came to pass, as the fourth hour before dawn approached unto the land known as Chosen, a messenger goeth forth into the bunk room of the birdmen, and he speaketh unto each saying "Arise ye and don thy pooppy suit, and go ye to the briefing place, for the leader has decreed that it shall be thus."

The birdmen awakening, revile the messenger and cry out saying his mother was afrighted by an alarm clock salesman, that his

father knoweth him not. And they bestir themselves and seek out their socks and go forth to break bread, and one breaketh his hand on the bread.

Then did they gather together in the sanctums, known as briefing places, and their voices are hushed, for they are in the presence of their leader. And so it came to pass that apprentices did arise and speak unto them, telling of routes, altitudes and targets, for such is their manner of speaking. And at last the



leader ariseth and sayeth unto them, "Yea, verily, thou art indeed fortunate this day, for thine enemy is sorry put and does naught to oppose thee. Go ye forth and gird thyselfs for battle."

And the birdmen did whisper one to another, "Yea, this will indeed be a day of great tribulation for the leader retireth to his sack and goeth not amongst us."

The birdmen go to their iron birds and prepare their rituals. And some are sore beset by trembling and redness of the eyes, having par-



taken too freely of wine, and they seeketh out their friends and speak unto them saying "Yea, buddy of mine, have I not many times been a brother unto thee? Therefore wilt not thou take my place in battle this day, for I am indeed overtaken by illness?" And their friends answereth saying, "Thou soundest faint and I cannot hear thee."

And so they go forth and there ariseth a mighty clamor as the great birds soar into the air. And the birdmen proceed unto the land of darkness, even to

the doorway of the evil one called by name, Joe.

Then the skies become dark with mist and the birdmen stray one from another and do miss their turning points and are lost. And they find not their targets, and great is their trepidation. And the birdmen call out one to another saying, "Childplay One, come thou unto me, for I am set upon by bandits and my flame goeth out." And Childplay One replyeth, "Verily, thou shouldst drop dead, for my wings grow heavy with ice and the flak hath found me."

And some falleth into the land of darkness, while one and another scurryeth like mice, and salvoeth their bombs into the sea, and returneth home empty handed and shooketh.

And the leader gathereth them together and speaketh harshly to them of the bad show and of many practice missions and of frozen promotions, and giveth them h— in general. So be it.

As the ball bounceth, so goeth our fortunes, but the wise pilot controlleth the bounce with shrewd use of aviation safety english.
—(Old aviation proverb)

There Is A Santa Claus

We take pleasure in answering at once and thus prominently the communication below, expressing at the same time our great gratification that its faithful author is numbered among the friends of the *Approach*.

Dear Editor:

I am 28 years old. Some of my naval aviator friends say there is no Santa Claus. The skipper says, "If you see it in the APPROACH it's so." Please tell me the truth, is there a Santa Claus?

Virgilius O' Handsome,
Ensign, USN, c/o FPO.

Virgilius, your aviator friends are wrong. They have been affected by the skepticism of a skeptical post-war age. They do not



believe except what they see. They think that nothing can be which is not comprehensible by their little minds. All minds, Virginius, whether they be men's or Nav-Cads, are little. In this great universe of ours an aviator is a mere insect, an ant, in his intellect, as compared with the boundless world about him, as measured by the intelligence capable of grasping the whole of truth and knowledge.

Yes, Virginius, there is a Santa Claus. He exists as certainly as Navy Regulations and operations orders and watch bills exist, and you know that they abound and give your life its highest beauty and joy. Yes he exists as certainly as Roger passes, perfect Charlie patterns, 92% gunnery scores, 4.0 check rides and undelayed recoveries. He is as real as your selection for promotion, as a service-wide pay raise or that bull's eye scored by skidding one into the target. He is as wonderfully real as that spin recovery beneath the overcast or that DR letdown that brought you out precisely over the field. He is as marvelously material as the hydraulic pressure that kept your wings spread when you forgot the pin.

Alas! Virginius, how dreary would be the world if there were no Santa Claus! It would be as dreary as if there were no gouges, or holes in the overcast or lost plane procedure, or no ensigns. There would be no child-like faith then, no leave, no cross-country RONS or accurate position reports to make tolerable this existence. We should have no enjoyment, except in sea duty and EDO. The eternal delight with which flying fills the

world would be extinguished.

Not believe in Santa Claus! You might as well not believe in the flight schedule. You might get your skipper to assign men to watch all the uptakes around Fly One on Christmas Eve to catch Santa Claus, but even if they did not see Santa Claus coming down the stacks, what would that prove? Nobody, not even the Flag sees Santa Claus, but that is no sign there is no Santa Claus. The most real things in the world are those that neither ensigns nor men can see. Did you ever see the air officer in the air, or a landing signal officer make a carrier landing? Of course not, but that's no proof that they are not there. Nobody can conceive or imagine all the wonders there are unseen and unseeable in the world.

You can probe a thunderstorm with radar to see what makes the turbulence inside, but there is a veil covering the unseen world which not the strongest search gear, nor even the united strength of all the preflight muscles in the program could tear apart. Only BuPers orders, OpNav Instructions, pilots handbooks, E6B computers and the Vn diagram can push aside that curtain and view and picture the supernal beauty and glory beyond the overcast. Is it all real? Ah, Virginius, in all this western world there is nothing else real and abiding.

No Santa Claus! Thank God! he lives, and he lives forever. A thousand years from now, Virginius, nay ten thousand years from now, he will still gladden the hearts of aviators who fly safely from Christmas to Christmas! ●

* Suggested by the famous "Yes Virginia" editorial.



Christmas Carol

by CDR R.P. Brewer

With apologies to
Charles Dickens.

Stave One: Barley's Ghost

Barley was transferred, to begin with. There is no doubt whatever about that. The original of his orders was signed by the personnel officer, the executive officer, the squadron duty officer and the chief of the watch. Commander Scrounge signed it. And Scrounge's name was good upon the detachment endorsement for anything he chose to

put his hand to "by direction."

Old Barley, the squadron aviation safety officer, had "had it."

Commander Scrounge knew he was transferred? Of course he did. How could it be otherwise with an ASO who was forever nagging the skipper about a bigger and better safety program that Scrounge considered something of a nuisance.

Scrounge never painted out old Barley's name from the

Squadron Organization Chart, however. There it yet stood, months afterwards, above the readyroom door. "Squadron VA Umpty Umph—Commanding Officer: CDR Ebenezer Scrounge; Executive Officer: LCDR Robert Scratchit; Safety Officer: LCDR Jake Barley." Sometimes people new to the squadron called Barley the S.O.; sometimes Scrounge was called the S.O.—be that as it may, Scrounge answered to



"I am here tonight to warn you that you have yet a chance and hope of escaping the fate of such an assignment as mine, Ebenezer!" Barley said.

both names. As skipper it was all the same to him.

Oh, but he was a real pistol of a skipper, was Scrounge! A real driving, charging aviator tiger-type. Weather or not, briefing or not, had little influence on him. No wind that blew was bitterer than he, no falling snow was more intent upon its purpose, no pelting rain less open to entreaty. Foul weather and poor maintenance didn't know where to

have him. The heaviest rain and snow and hail and sleet, it was said by the LSOs, could boast of the advantage over him in only one respect—they often came down handsomely, and Scrounge never did.

Nobody ever stopped *him* in the passageway to say, with gladsome looks, "Hi, Commander, how's everything? Come over for a cup of coffee?" No lieutenants implored

Continued next page

Christmas Carol

Continued

him to bestow a trifle of a long weekend; no wingman asked him for the takeoff order; no pilot or navigator ever once in all his life inquired the route to such and such a place of Commander Scrounge.

But what did Scrounge care! It was the very thing he liked. To barrel his way along the crowded airways, on an operational clearance, with his tail-end-charlies of his formation hanging on for dear life—that was the Scrounge System — learn the hard way, as he had done!

Once upon a time, of all the good days during the squadron shore based training period, upon a Christmas eve, old Scrounge sat busy disapproving leave requests in his office. It was cold, bleak, biting, foggy; real ensign weather.

"Merry Christmas, skipper!" cried a cheerful voice. It was Scrounge's exec, Scratchit, who had finished cleaning out his basket.

"Bah!" said Commander Scrounge, "humbug! Out upon merry Christmas! What's Christmastime to you but a time for letting pilots go on leave; a time for scraping together a lousy part-time flight schedule. If I had my way, every idiot who goes about yakking 'Merry Christmas'

should be dipped in hydraulic fluid and put in back!"

"But, skipper!"

"Mister, keep Christmas in your way, and let me keep it in mine—getting 'em into the blue. And another thing, knock off these proposals for expanding the safety program! —and get off my back about more ground school!"

"Sorry, skipper, I just thought we might get together for a ration of egg-nog over the weekend and talk over the squadron accident rate. It's pretty serious, you know and I was thinking that when you got around to naming a new Safety Officer we could drop that collateral duty as Welfare and Recreation Officer . . ."

"Safety Officer!" growled Scrounge, "as if that were the only thing in the world more ridiculous than a merry Christmas. Good afternoon!"

"Well, anyway, Merry Christmas, skipper!"

"Good afternoon."

"And a Happy New Year!"

"Good afternoon!"

Later, when at length the hour of securing arrived, Scrounge walked out to take his melancholy dinner in his usual melancholy BOQ. He lived in a gloomy room in the senior officers' wing (his wife and family preferred to re-

main out on the coast.) The room was sparsely furnished with a bed, overstuffed chairs, a desk, a lo-fi record player and various articles of flight gear and 19 plastic aircraft models.

Scrounge had closed and double-locked his door, and placing a worn record of "Heartbreak Hotel" on the phonograph, had stretched out on the bed when there sounded a clanking noise, deep down below, as if some public works plumber were dragging an anchor chain out of the locker. Then he heard the noise much louder, on the floor below, then coming up the stairs, then coming straight toward his door.

It came through the heavy door, and a vague figure passed into the room before his eyes.

"Barley!" murmured Scrounge, marveling but unafraid, "Jake Barley!"

The apparition spoke not a word, but seated himself familiarly beside the record player and glared at Scrounge, who squirmed a bit before growling:

"Well, now that you're here, say something."

The figure frowned. "Why do you doubt what you see?"

"Because you are probably

only an undigested bit of spam, a blot of A-one sauce, a crumb of velveeta, a fragment of an underdone cheeseburger!" But even so, Scrounge was fearful, and he added hastily, "Why do you seek me out?"

"Because I am cursed by BuPers to roam the world, to pass the word to all concerning matters of aviation safety.

rition, wringing his hands, "aviation safety was my business. The problem of efficient squadron operations was my business—the dealings of my pilot ability were but a drop of water in the comprehensive ocean of safe flight operations! I am here tonight to warn you that you have yet a chance and hope of escaping the fate of such an assignment

orders such as mine. Expect the first at oh one hundred tonight."

Whereupon the figure of Barley drifted to the door and disappeared. Scrounge moved after him to try again the door, and he essayed a growl: "Humbug," but stopped on the first syllable. Pondering over these events he fell asleep without bothering to undress.

Stave Two: The First of the Three Spirits

When Scrounge awoke, it was quite dark, until suddenly a nearby ship's bell in the OOD shack tolled a melancholy two bells. Light instantly flashed up in the room and Scrounge beheld the strange figure of a small, bearded old man in aviation greens. A slight Mark VIII scar over one eye dated his flying to have been before the days of shoulder straps or crash helmets. In one hand he carried a battered pilot's log book.

"I am the Ghost of Accidents Past," the figure intoned.

"Long Past?" Scrounge managed.

"No. Your past. The things you will see are shadows of the things that have been. Rise and walk with me!"

They passed through the wall, and stood in the crowded hangar of a busy primary training field. The Ghost paused at a certain door and asked Scrounge if he knew it.

"Know it! I went through flight training here!"

They went in. At the sight of a grey-haired commander in summer khaki sitting at one



"Barley!" murmured Scrounge, marveling but unafraid, "Jake Barley!"

Thus am I forced to make amends for the misused opportunities of many squadron tours!"

"But you were always a pretty sharp aviator, Jake," faltered Scrounge, who now began to apply this situation to himself.

"Aviator!" cried the appa-

as mine, Ebenezer."

"Thanks, buddy, I . . ." began Scrounge.

"You will be haunted by Three Spirits," interrupted Barley.

"This is a favor?" asked Scrounge dubiously.

"Without these visits you cannot hope to shun a set of

Christmas Carol

Continued

end of a long green table, Scrounge cried in great excitement: "Why, it's old Flipwig, the Chief Flight Instructor! Bless his heart — b-but I thought old Flip got it at Midway?" But the Ghost merely pointed to the other end of the table where a thoroughly frightened avcad huddled in a chair.

"Wh-why, that's *me!*" Scrounge murmured in astonishment, "I remember the very day I was up for special commandant's time, after I got two straight downs for improper procedure . . ." His voice trailed away as he leaned forward to attend what the commander was saying to the avcad.

" . . . seem to be having more than your share of troubles, Scrounge. Looks like you've bent up two N3Ns already, not to mention some rather borderline grades in groundschool. What seems to be the trouble?"

The greying commander listened gravely to the end of the avcad's wretched story of sickness, family troubles and hardnosed instructors. Then, as the young Scrounge waited fearfully, the officer permitted

a slight smile to appear.

"Well, son, maybe you aren't the world's best pilot, but I guess we can give you a chance to get a little more dual



program was really rough when I went through — we didn't have any Santy Clauses then—ah, get me out of this place."

"I told you these were the shadows of the things that have been," said the Ghost, "that they are what they are, do not blame me!"

Stave Three: The Second of the Three Spirits

Then Scrounge was back in his own BOQ bedroom, awakening to squint at a great light in the next room. Stumbling to the door to chew out some

"I am the Ghost of Accidents Past," the figure intoned, "Long Past."

time and then try it again. You know, most of us have had a little trouble at one time or another . . ." The voice faded and the Ghost turned to Scrounge.

"Such a small matter," he said, "to find a workable solution to a problem, eh?" Scrounge could only stare foolishly.

"Well," he complained, "the

transient pilot's bull session, he saw a giant of a Phantom seated at a flight planning table. This Spirit was splendidly dressed in a spangled flight coverall and Mae West with sequins.

"Come in, Buster! Come in! Let's get the show on the road. I'm the Ghost of Accidents Present. Would you know me?"

"Uh, I don't think I have, fortunately," said Scrounge uncomfortably, "unless you want to count that barrier I got during the last refresher carquals—but that was hook bounce, and we were able to fix the damage in less than the 25 manhours required by 3750.6B, so it wasn't a real accident.

"Ah! But you and I know better, don't we, Ebenezer?" chuckled the Spirit, "We know you held off after the cut and floated into the fence, eh? But no matter, let us be off, and perhaps you may learn yet another lesson."

Then the room and all its contents vanished and they stood in the squadron ready-room where Scrounge beheld himself briefing a flight, and he squirmed to observe the speed with which he went over the points to be covered. Moving to the rear of the room, the Spirit permitted Scrounge to hear a whispered remark from one pilot—one Ensign Timm, Scrounge noted, called "Tiny," by his shipmates.

"Cheees!" murmured Tiny to a wingmate, "I still don't know how we rendezvous. And what about that wet runway on landing? Are we supposed to brake hard on the wet surface, or use aerodynamic braking . . . ?"

"Beats me," mourned the other, "I'm worried about where we're supposed to go if the field gets socked in while we're out."

"In that case," murmured Tiny Timm, "God help us every one."

Scrounge fidgeted wrathfully at the stupidity of this conversation. "Danged knuckleheads! I told 'em I'd pass the word about that when and if we got into some kind of a lashup . . ." Then he flinched on recalling something. The Spirit nodded at the thought which Scrounge was considering.

"That's right, Buster. You goofed because one of the flight had to land first with no

"Come in Buster. Let's get the show on the road. I'm the Ghost of Accidents Present."

droptanks transferring, and he braked himself into a big fat skid that put him off the runway with a busted wheel. Remember?"

Scrounge nodded miserably. "Uh, huh. I guess I was a little brief on the briefing. But it seems to me those young characters could have . . ."

"That's just why," interrupted the Spirit, "It's even more important for you experienced pilots to give these young gents all the good dope you can think of, and then some."

And suddenly the Spirit was gone, and as Scrounge looked about, he heard the ship's bell again, striking eight bells. Remembering the prediction of Jake Barley, he beheld a solemn Phantom, full pressure-suited and helmeted, coming toward him.

Stave Four: The Last of the Spirits

Scrounge trembled to see this Spirit, which with face



concealed by the plastic faceplate, spoke not but extended a gloved hand.

"I am in the presence of the Ghost of Accidents Yet to Come? Ghost of the Future! I fear you more than any spectre I have seen, but get on with it."

It gave him no reply. The hand was pointed straight before them. They seemed scarcely to enter the hangar area, for the walls rather seemed to spring up about them. But there they were in the heart of it, outside an

Christmas Carol

Continued

office door. The Spirit stopped beside one little group of pilots. Scrounge advanced to listen to their talk.

"No," a lieutenant was saying, "I don't know much about it either way; I only know he piled one up when he ran out of fuel on the final approach."

"When did he prang it?" inquired another.

"Last night, I believe."

"Why, what happened? I never thought he'd buy the farm."

"Beats me," said the first, with a yawn, "Personally, I think he made the same mistake he made on the flight that Tiny Timm went in on the flameout."

"You'd think," said the other, "that after the Board found that Tiny might have gotten back if he'd been sufficiently briefed, that he'd have changed his ways."

Scrounge was at first inclined to be surprised that the Spirit should attach importance to this conversation. Then he looked about for his own image, but another commander sat at his desk, and he saw no likeness of himself amongst the personnel moving about the squadron area.

Leaving this scene they went to another part of the air sta-

tion, to a small conference room. A rather senior-looking commander sat smoking a cigar at a table in the room. Scrounge and the Phantom came into the place just as several other officers, Bob Scratchit and another lieutenant,

"Scrounge trembled to see this Spirit, which with face concealed by the plastic faceplate, spoke not but extended a gloved hand."

ant commander and a flight surgeon entered. Seating themselves about the table, the little group began arranging various notes and documents.

The Commander indicated the thick folder which Scratchit had placed before him.

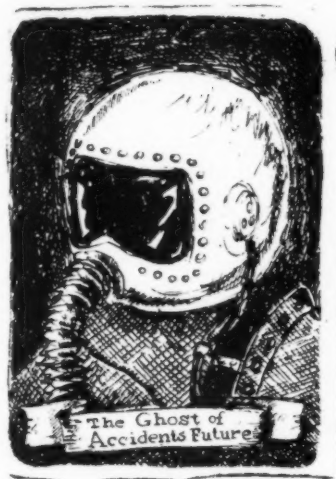
"Guess this about winds it up, doesn't it?"

"Looks like it, command-

er," said Scratchit, with a sigh, "all we need now are the signatures and an endorsement."

And as the Commander leafed through the folder, Scrounge was suddenly assailed by a terrible suspicion. He barely heard the words which the Commander was reading from the report: "... primary cause of this accident is pilot error in that the pilot failed to plan properly..."

The Spirit stood behind the Commander seated at the table and pointed down to the report folder. Scrounge was beset with an uncontrollable



trembling.

"Spectre," said Scrounge, "tell me what pilot was that whose accident we heard discussed in the hangar?"

The Ghost of Accidents Yet to Come pointed to the AAR folder on the table.

"Now hold up here just a cotton-picking minute," quavered Scrounge, "let's get this deal squared away. Are those

the shadows of the Things That Will Be, or are they shadows of Things That May Be only?"

Still the Ghost pointed downward to the Report.

"But look here, sir!" choked Scrounge, "the way I understand it is that certain things, if allowed to continue, must lead to certain conclusions. But if a gent gets the word, the conclusions will change. Isn't that the way with this setup?"

The Spirit was as immovable as ever.

Scrounge crept towards the Report, shuddering as he went; and following the finger, read upon the Aircraft Accident Report folder his own name: SCROUNGE, EBE-NEZER.

"No, Spirit! Oh no, no! Listen, buddy! I am not the pilot I was, I will not be the aviator I must have been but for this revelation. Assure me that I yet may change these shadows you have shown me by an altered life. Tell me how I may cancel this AAR!"

Holding up his hands in one last prayer to have his fate reversed, he saw an alteration in the Phantoms' helmet and dress. As though he had fallen victim to hypoxia, Scrounge saw the figure blur, shrink and collapse, and dwindle down to a bedpost.

Yes, and the bedpost was his own. The bed was his own, the room was his own. Best and happiest of all, the Time before him was his own, to make amends in!

Overjoyed, he ran to the

window, opened it and put out his head. No fog, no mist, no night — clear bright, stirring golden day.

"What's today?" cried Scrounge, calling down to a messenger who moved past.

"Today? Why, today is Christmas day."

"It's Christmas day! I haven't missed it. Wahoo! Hey, mate! Do you know the quarters of Lieutenant Commander Scratchit?"

"I sure do!"

"Then get over to his room on the double. Tell him his commanding officer says he's to report to squadron immediately!"

"Aye, aye, sir!" The man was off like a shot.

Scrounge, all a'chuckle, dressed quickly and went down to the squadron area. The duty section by this time was pouring forth, just as he had seen them with the Ghost of Christmas Present. Scrounge regarded every one with a delighted smile. He looked so irresistibly pleasant, in a word that three or four good humored fellows ventured a "Good morning, sir! A Merry Christmas to you!"

Scrounge had only seated himself at his desk when his exec arrived, displaying an understandable concern.

"Hallo!" growled Scrounge, in his accustomed voice, as near as he could feign it. "Try and get here on time once."

"Sorry, sir, my alarm clock didn't go off."

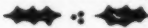
"Humph! Well, here's the thing. I'm not putting up with this sort of stuff any longer.

And therefore," Scrounge continued, leaping from his chair and giving Bob such a dig in the ribs that he staggered back, "and therefore I'm about to give you that safety officer you want, and to put your safety program into the squadron doctrine! I'd thought of young Timm—the one they call Tiny for the billet."

Bob gaped, and looked about uncertainly.

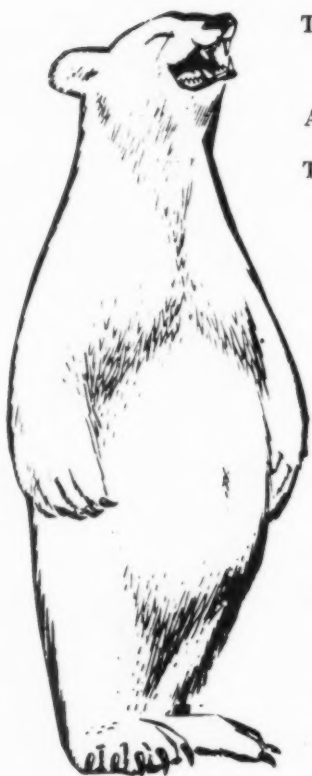
"A Merry Christmas, Bob!" said Scrounge, with an earnestness that could not be mistaken. "A Merry, and a Safe Christmas, boy, and we'll discuss this thing further tomorrow, after everyone gets the day off! I'll need the day off, too, you know," Scrounge grinned, "if I'm to be the first gent to begin your ground-school course! Now how's about that Christmas toddy you mentioned yesterday? We could work out some of the details, then, huh?"

"Duhh-h," said Scratchit.

Scrounge was better than his word. He did it all and considerably more as he changed his philosophy from "learn the hard way" to "teach by example." Quite naturally neither he nor Tiny Timm were subjects of AARs, and it was always said of Skipper Scrounge that he knew how to fly with the best, and how to celebrate Christmas with the best. And may that be truly said of us, and all of us naval aviators! And so, as the new ASO, Tiny Timm observed, God Bless Us, Every One! 

"Never Eat the Liver of a Polar Bear."—
Naval Pilots Information File (NavAer 00-
807-33); Para. 9, "Hints on Survival in the
Arctic," (quoted in its entirety)

NEVER EAT THE LIVER OF A POLAR BEAR



Oh, a pilot's plight need be no fright
When his plane is down in the Arctic
The problem of living offers little misgiving
In survival ashore or aquatic.

For the marvels of man and the wonders of science
Have equipped him to weather the worst
He can master the flora and conquer the fauna
To answer his hunger and thirst.

Sunburn and frostbite and beasts in the night
He regards with scornful immunity
And disease he ignores and retains all the mores
Of a normal suburban community.

There is, however, one law of existence
Which the survivor must note and beware
Though you're short on persistence and low on resistance
Never eat the liver of a polar bear!

A light snow souffle will your hunger allay
And some blubber will add to your fare
Try reindeer in season, but remember the reason
And never eat the liver of the polar bear!

Exist on moss and lichens, the *lousewort's* very good
And fillet of juicy tundra hare
Toss a tasty bark-root salad, but keep in mind this ballad
And never eat the liver of a polar bear!

Organize the natives into unions
Promote their health and general welfare
Fraternize if you must, but don't overlook this trust
To never eat the liver of a polar bear!

Ah, the lonely nights are six months long
And it's all too easy to despair
But though help be long arriving, never cease your striving
Not to eat the liver of a polar bear!

And when at last the vigil's ended
And, still puzzled, you're rescued by air
As they curiously eye you, be sure to ask *why* you
Never eat the liver of the !#*#*!?! polar bear!

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Widespread misconceptions have always existed about alcohol and its effect on the human body. Some men have thought themselves exempt or not as susceptible to the adverse reactions brought about by use of alcohol.

The use—and especially overindulgence—of alcohol is of primary concern to the aviator. His life depends on his knowledge of body chemistry as it applies to alcohol.

Dr. Ross A. McFarland has listed several facts about the effect of alcohol on the body: alcohol is absorbed rapidly without benefit of digestion, it appears in the bloodstream shortly after it is taken into the body, especially if the stomach is empty; it shows up in the tissues and organs in slightly more time than is required to trace the alcohol in the blood stream.

Concentration of alcohol and the rate of its absorption is affected by several factors:

- The total amount of alcohol in a drink has a direct relationship to the concentration in the blood.
- The dilution of a drink directly influences the rate of absorption.
- The presence of food, especially such fatty substances as cream, milk, butter, or vegetable oils, retards the rate of absorption.
- The variety of beverages has a marked influence; the alcohol of brewed beverages, such as beer, is absorbed more slowly than distilled liquor because the carbohydrates and other material in the beer act like food in slowing the process.
- By drinking slowly and allowing time between drinks, an opportunity is given for the body to dispose of some of the alcohol before more is added, and the concentration of alcohol in the blood does not rise so high as with rapid drinking.

Alcohol is a depressant rather than a stimulant. It affects muscular skill, sensory acuity, memory and other measurable psychological functions.

Movements of the eye while reading or fixating on an object show significant variations in efficiency, averaging 21% of the normal values after 1½ pints of beer or one to two ordinary cocktails. Alcohol has a pronounced effect on memory, judgment and reasoning. Although the magnitude of the effect varies from person to person, its direction is never reversed. The primary effect seems to be that attention and concentration are rendered less flexible for receiving new stimuli.

The ability of a pilot who is under the influence of alcohol to monitor a complex collection of instruments is directly lessened in proportion to the degree of alcohol influence. In today's high-speed, high-performance aircraft it is mandatory that the pilot possess all his faculties sharpened to their finest edge if he is to meet this challenge and live to once again sing AULD LANG SYNE.

—FLY, NATC Pensacola •

CHOPPER PITCHUP PHENOMENA

by Robert S. Decker



... the aircraft was observed to pitch up 40 degrees and rotate to the left out of control.

Shortly after launching from a CVA the pilot reported to Pri-Fly that he had a stuck throttle with a power setting of 2700/52. He elected to continue to home field nine miles away accompanied by another SH-34J.

After receiving clearance to make an emergency landing at the field the pilot stated that his airspeed was 120 knots and that he would secure the mixture and autorotate. His altitude at this time is estimated to have been 800 feet.

The pilot announced that he was cutting his mixture and moments later the aircraft was observed to pitch up 40 degrees above the horizon and rotate to the left out of control. Observers noticed that the rotor blades were almost stopped. It made a tight spiral and contacted the ground in an extreme nose-down attitude. There were no survivors.

The brief goes on to state why the throttle stuck and the action taken to prevent a recurrence. It continues with comments on pitch-up phenomena and loss of control at high speeds.

It is not the intention of this article to criticize, nor to reopen the investigation into this particular

accident. Neither does it wish to imply that the crew did not do everything within its power to handle the situation.

Unfortunately, no one knows the exact circumstances that took place that disastrous morning. However, as a result of this accident many misconceptions of the SH-34J's handling characteristics have come to our attention. These same misconceptions also have been related to other Sikorsky models. Although the Flight Manual carries the correct information, it is felt that a comprehensive discussion of the matter would be in order at this time to clear the air.

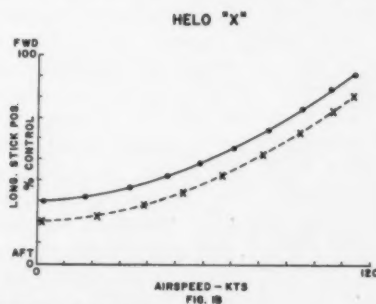
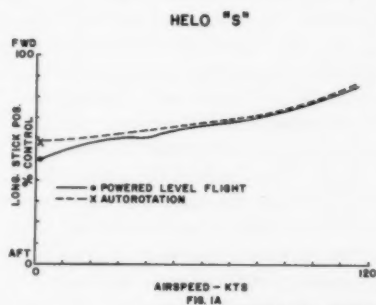
Let us start by describing a desirable feature in any helicopter's control system wherein the cyclic control has a positive gradient during all regimes of flight. This means that the control moves forward for each increase in airspeed and remains forward of the last setting when the airspeed is stabilized at a higher value. Many aircraft meet this requirement yet their control positions for equivalent loading conditions and identical airspeeds in powered flight and autorotation are different. In other words, the static cyclic position



ntrol.

varies with the regime of flight for any given loading conditions.

Figures 1a and b show some typical plots of longitudinal cyclic control versus airspeed. In the case of Figure 1b, an abrupt change from one regime of flight to another can cause considerable aircraft divergence if control is not reacted immediately. For example, if the cyclic stick is fixed at 60 percent travel, which produces 80 knots in powered flight and 90 knots in autorotation, and autorotation is suddenly entered, the aircraft will have a tendency to nose over and increase speed.



TYPICAL PLOTS OF LONGITUDINAL CONTROL POSITIONS

Conversely, if the stick position plots are reversed, the aircraft will nose up and slow down.

The configuration of the aircraft, ie., size and shape of fuselage, tail surfaces, stub wings, . . . causes this to occur and the degree of divergence can be fairly well predicted before actual flight tests. The control positions and general handling qualities in today's helicopters vary considerably, which might tend to confuse the pilot who flies only occasionally and in several different models.

When entering autorotation, the H-34 retains, within approximately 5 knots, the same speed held upon entry. Suffice to say, the handling qualities during, and in the transition to, autorotation are equally as good as those in powered flight. There are no special techniques or unusual characteristics to make autorotation any different or more hairy than powered flight at any speed. The only extra precaution necessary is to control rotor revolutions by collective pitch during steep turns and flares. The effect of center of gravity loadings on such entries is negligible.

Since the handling qualities are equally good in any regime of flight, let us look into the transition from powered flight to autorotation. In all Sikorsky helicopters, control response is such that within one revolution of the blades a control input takes effect. The general effect of a control change is a smooth transition from one attitude to another with no increase in roughness other than that due to the build up of G's in a steep turn or a pullout. The control inputs necessary to enter autorotation are sensed immediately by the rotor system and become evident within one revolution of the blades. Therefore, although the maneuver may be somewhat frightening to the other occupants, it can be seen from this that the quicker the collective is lowered, the quicker autorotation can be entered.

Up to now we have been discussing controls

and their reactions without considering what the engine is doing. Let us suppose that the transition from powered flight to autorotation is necessary because of engine failure. First, we must assume that the pilot will need time to recognize the problem and react accordingly. Our experience over the years has indicated that one second from time of failure to initiation of recovery action is more than enough. Therefore, for the purpose of discussion at this point, let us suppose that not more than one second will take place after engine failure before recovery is begun. When engine failure occurs, simultaneously and immediately the rotor speed starts to decay and the aircraft yaws and rolls to the left because the controls are set to counteract torque, which is suddenly removed. Auxiliary servo, when dependent on the engine, is also lost, but this does not create any undue problem. Generally, it can be considered helpful as the collective control starts to creep downward due to loss of the "bootstraps."

The rate of rotor decay depends on the degree of collective pitch being used at the time of failure. The higher the pitch, the greater the drag—consequently, the greater the rate of decay. From the lowest rate of deceleration to the highest is approximately ten revolutions per second (20 revolutions per second to 30 revolutions per second) and is not too significant during a delay of one second or less. Greater delays, naturally, produce more danger.

It is quite evident from the foregoing that the quicker the collective is lowered, the less rotor decay will occur. Earlier, it was stated that a control movement becomes effective in one revolution of the rotor, so the transition to maintain a safe autorotation RPM can be completed as collective is lowered. The yawing and rolling effect that accompanies the rotor decay on engine failure is generally not bothersome to the average pilot. He will make the necessary corrections automatically, and many pilots will not even realize that they applied right lateral control.

Up to now we have been assuming that there has only been a delay of one second between engine failure and the start of recovery. Let us see what happens when the delay is extended. Again the rotor RPM will decay at a particular rate commensurate with the collective pitch angle. Assume that the pilot maintains heading by appropriate lateral and directional control movements. Forward speed of the helicopter, due to inertia, is dropping very slowly compared to the

rate of rotor decay, and for all general purposes it can be assumed to be essentially constant during the relatively short interval involved. As the rotor speed decays, centrifugal force of the blades decreases, yet the demand for lift prevails. As centrifugal force continues to decrease, the blade coning continues to increase trying to maintain lift. Simultaneously, the aircraft is beginning to lose altitude and the blades are trying to assume an autorotative condition with the relative wind now flowing upward through the rotor.

All these factors are causing the blade angle of attack to increase with an associated increase in drag. This drag builds up rapidly and there soon reaches a point where, if collective is not lowered, the angle of attack becomes so great that autorotation is impossible and the rotor becomes completely ineffective. During the short interval that the rotor speed is decaying and the coning is increasing, control becomes less effective due to the decrease in the moment of the rotor system caused by the decrease in effective rotor diameter and subsequent loss of lift.

Simultaneously, as the rotor slows down, approaching the RPM at which insufficient lift is generated to sustain flight (still at approximately the same forward speed as when the engine failed) blade stall begins and progresses very rapidly. The symptoms are a gradual decrease in control effectiveness which is evidenced by the nose rising well above the horizon quite suddenly in spite of forward control motion to sustain it. Immediately after the aircraft noses up, it falls off to the left in a very steep nose down attitude. The large total drag of the rotor, combined with the inherent stability of most rotors, contributes to the nose up and will take over as control becomes ineffective. This inherent stability can be likened to coning blow back which results in a rearward movement of the total rotor thrust and occurs to any rotor with forward velocity. Simply stated it is the natural tendency to resist any velocity and to seek a more symmetrical loading such as that in hovering. This nose-up action further increases the blade angle of attack and, combined with the other chain of events, leads to severe stall. This, in effect, results in an extremely unbalanced rotor disc lifting condition where the right (advancing) side produces more lift than the left (retreating) side, thereby causing the aircraft to fall off to the left.

From this description it should be evident that the delay recovery from an engine failure can become disastrous. However, recovery can be ef-

ected after stall occurs by following the prescribed procedures, altitude being the only requisite. It should be understood that if any recovery is delayed until such time as damage occurs to the controls, no guarantees can be given. Remember, everything is relative and *time* is important to effect a safe recovery, but equally important is *altitude*. Enough altitude at the right time is the difference between a safe landing and a crack-up.

True, one can point to the height-velocity diagram and call this the criterion for safe landings. It is, if one is an average pilot over a paved runway with zero wind conditions. It does not, nor was it intended to, promise that as long as the pilot is above the minimum altitude, he is guaranteed a safe autorotational landing. It was basically designed to present to the pilot the capabilities of the aircraft and the average pilot. Pilots sometimes mistakenly use it as an overall criterion for operation. To illustrate how wrong this can be, consider, in normal operations, the amount of time a paved landing area is directly below you. Even if you had it, would you be strategically located into the wind so that the landing could be made as slowly as possible with a minimum of ground roll? The answer is obviously "Not very often."

Someone might ask why height velocity diagrams are not prepared for various operations. At first it might sound feasible, but when the variables are considered, the impossibility of preparing a weight velocity diagram to cover all operational requirements is seen. Flying into the wind, as compared to flying downwind, is one factor to be considered. The velocity of the wind is another factor. The type of terrain is a third. Depending upon the availability of a suitable landing spot, it may be necessary to fly at 4000 feet in one area and only 1000 feet in another. Over open water with an amphibian or in a land configured aircraft where a forced landing would mean a ditching the criterion would be simpler by only requiring sufficient altitude to turn into the wind before landing. It appears that, even when considering only the wind, the necessary altitude required to turn into the wind from any point of the compass would involve an infinite number of curves.

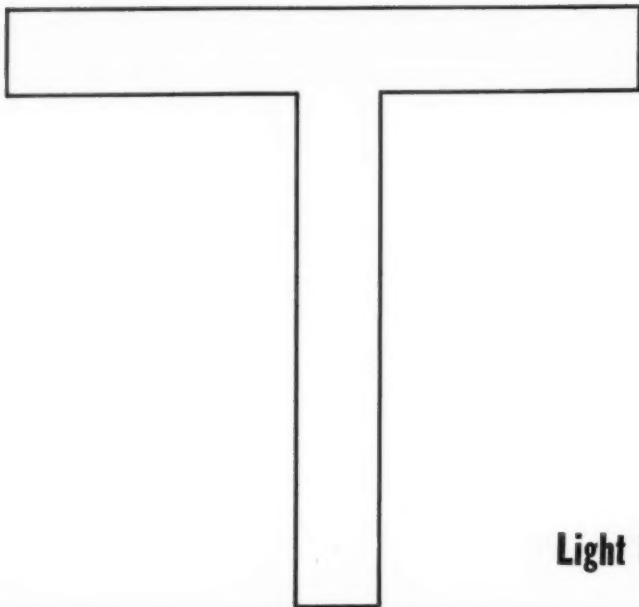
If you can wrack your brains hard enough to remember your primary flying days, you will remember that much of your training was spent on sharpening your air-sense. This meant that you were taught to have a landing spot picked

out at all times in event of emergency and to know which direction to approach it (conscious of wind direction). If you were caught in a compromising position or could not judge your approach you were given a down. As you advanced into operational work, in many cases, safety was compromised for tactics and as a result, many pilots lost sight of the original air-sense training. The fact that helicopters can fly low and slow also led to a certain disregard for flying at a sufficient altitude for safe emergency operations.

So much for the "whys"; let us look at the "wherefores." Proper operational altitude when flying into the wind is that which allows a glide into the nearest suitable landing area. Proper operational altitude when flying downwind is that which allows a 180 degree gliding turn into the wind to the nearest suitable landing area. Proper operational altitude when flying crosswind is that which allows a gliding turn into the wind to the nearest suitable landing area. These are the cardinal rules. If the suitable landing areas are such that, even though you are heading directly into the wind, a 360 degree turn has to be made to effect a safe emergency landing, naturally the altitude must be increased. To illustrate the difference in altitude necessary to do a 180 degree and a 360 degree turn, let us take an SH-34J at 60 knots. To complete a 180 degree turn, to maintain 60 knots until the flare and then to effect an autorotation landing into the wind generally requires from 400 to 600 feet. To do a 360 degree turn and to maintain the same conditions generally requires from 1000 feet to 1200 feet.

Remember also that the flying speed at which the emergency occurs affects the rate at which the aircraft settles, and if a pilot is not conscious of his speed, he can misjudge his approach. When entry into autorotation is made from a high forward speed, a flare to decelerate is necessary to attain the best autorotational speed. In so doing, the rate of descent is reduced during this deceleration. Just the opposite is true when the entry is made from slow speed. That is, an acceleration with a subsequent increase in rate of descent takes place.

Thus it can be seen that knowledge of capabilities, yours and those of the aircraft, and knowledge of the wind conditions, plus continuous scanning, make up part of what is known as "air sense." A good knowledge of your aircraft through training and experience plus air-sense constitute the basic formula for a good safety record. ●



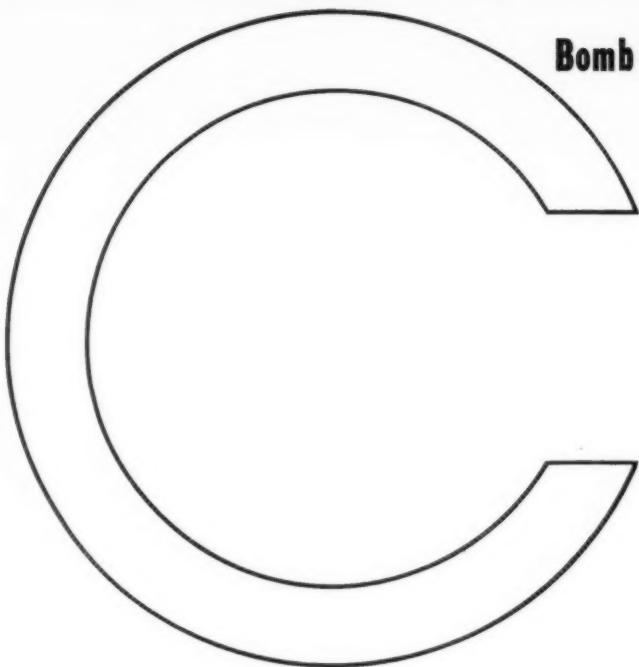
Light Slight

I MANNED 919 for the 1800 strike against the ship. Turnup was normal except that the tachometer light was out. The discrepancy could not be corrected prior to launch but I elected to take the bird as it was. *(A burned out instrument light on any of the primary flight or engine instruments should be down gripe for night flyers).*

The flight was normal and I commenced a CCA with 3200 pounds of fuel remaining. During the descent I had a close interval on the aircraft ahead. I therefore requested and received clearance for a 360-degree port turn to establish separation.

As I continued the approach, the

AND



Bomb Blast

A FLIGHT leader didn't practice what he preached and caused considerable damage to his A-4 (A4D). Although he was not injured, his pride probably was.

He was leading a flight of three aircraft on a scheduled close air support training mission to a live impact area. Target for the first mission was a gun emplacement about 5250 feet above sea level. Each pilot was to drop one Mk 82 bomb. The flight leader climbed to 11,500 feet MSL, 260 KIAS, and commenced a 30-degree dive on the target. At this angle and with speed increasing to 410 knot, altitude loss during recovery would be about 1500 feet.

"Bomb released at altitude 7700 feet—now commence a 3-G re-

small penlight which I had previously focused on the tachometer dimmed and finally burned out. I tried my Boy Scout type flashlight to light the tach but the brilliance was too great so I decided not to use it. I also tried the DC lights but they produced a high level of cockpit illumination which reflected distractingly from the canopy and the instrument panel. I decided then to use fuel flow to approximate engine power settings since I could not see the tach indications at all. Prior to picking up the ball I made a final check of the tachometer with my flashlight. I was carrying 87% and 3000-4000 PPH fuel flow.

Just prior to intercepting glide

slope the white map light on the aft starboard console came ON. Because I could not secure the light and still continue the approach, and because the distraction was not acute, I decided to continue the approach. I called the ball with 2800 pounds of fuel and on speed. The LSO informed me I had no approach light and requested a gear check. I transmitted that all three gears were indicating down-and-locked and continued the pass with a roger ball and 135 knots. I was experiencing some restriction to forward visibility due to an oil film being deposited on the forward windscreen by the air conditioning system. About 15 seconds out, my airspeed went to 138

knots and the ball started to go high. I made a minor power adjustment and nose correction to stop the ball, and flicked a fast chevron approaching the ramp.

The last time I remember looking at the airspeed I was indicating 142 knots. I crossed the ramp with a high ball and fast chevron showing, slightly nose-down, with the distinct impression I would bolter. The aircraft hit the deck with a higher than normal sink rate and a sharp explosion occurred as the port main gear sheared. The aircraft came to rest off the port wingtip and slightly left of centerline. I secured the engine on signal and evacuated the cockpit.

truth and consequences

A REVIEW OF SIGNIFICANT AIRCRAFT ACCIDENTS

covery—recovery complete at about 6300 feet.”

“What was that?!!! Sounded like an explosion! Oh-Oh! Fire warning light ON! Better reduce power and head for home! Now the fire warning light has gone out, since I’ve reduced power. Better tell my wingman to come down and take a look-see.”

The wingman reported there was a hole in the dorsal fin and that the paint appeared to be scorched around it and that the scorched area was not enlarging. He had been struck by fragments from his own bomb.

After contacting the tower and declaring an emergency, the pilot elected to make a flameout approach pattern to the duty runway.

The flight leader had briefed his wingman that a minimum recovery altitude of 1000 feet above terrain would be observed, but failed to do so himself.

If he had released at an indicated altitude of 7700 feet MSL, as stated, his actual release altitude would have been 7400 feet, assuming an altimeter lag of at least 300 feet. Therefore, his recovery altitude would have been 1500 feet less, or 5900 feet MSL, less than 700 feet above terrain, instead of the stated 6300 feet.

This discrepancy between predicted and stated minimum recovery altitudes could have been caused by the pilot either misreading his altimeter or varying his dive angle/release airspeed from

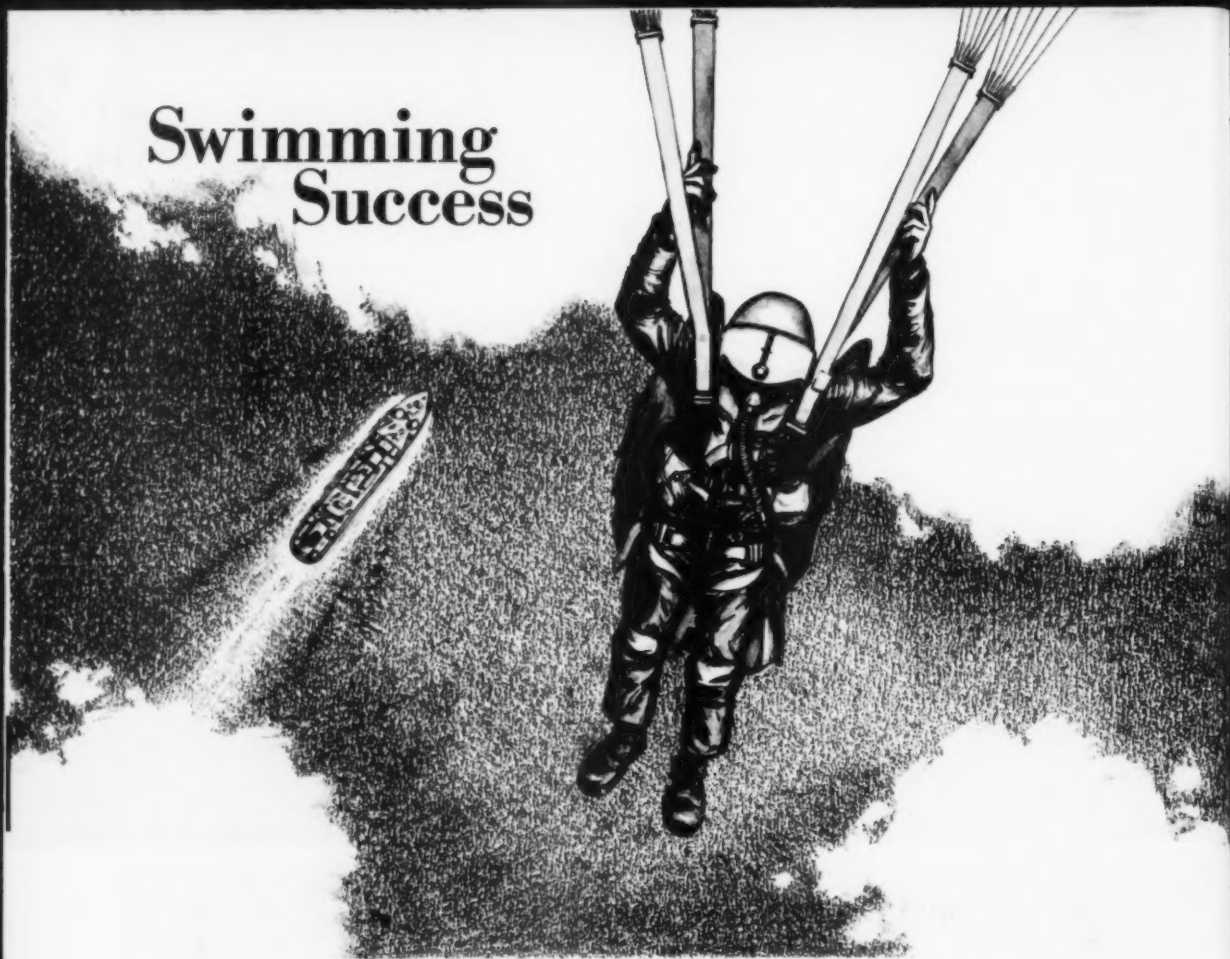
the stated 30 degrees and 410 knots. It also could have resulted from a combination of the two.

The accident board could not determine which of these factors caused the discrepancy, or at what altitude above the terrain the collision actually occurred.

The essence of the board’s opinion was that the pilot released at an indicated altitude of 7700 feet as stated.

In view of the pilot’s past experience, the board felt that his estimate of dive angle and release airspeed were probably correct, and that the actual recovery altitude was less than 6300 feet MSL, and less than the 1000 feet minimum terrain clearance for which the flight was briefed.

Swimming Success



Climbing at 6000' a minute, as I passed approximately 15,000' I experienced a terrific explosion and retarded the throttle to IDLE. I then realized I had lost my canopy and had not had an engine malfunction. My first thought was to lower my visor and then I realized my visor was already down. Simultaneously I felt the aircraft yaw severely to the left. I applied right rudder and right stick, but both were ineffective. As the aircraft yawed and rolled to the left even further I realized I had absolutely no control. I selected guard but the spin had become so severe I was unable to transmit a Mayday report.

I brought my feet back against the seat, straightened my back and pulled the face curtain. I waited for what seemed a reasonable period and then allowed the curtain to retract about a foot and then pulled with all my force. There was no time for doubts on the second pull as the ejection

was every bit as severe as I had imagined it would be. From the initial phase of the ejection until I stabilized under the pilot chute, I was sure that my back was broken. (It wasn't—the only injury I sustained was a mild abrasion.)

I held the curtain in front of my face until I was sure my forward trajectory had stopped and then released it. I looked up, checked the pilot chute and tried to remember my ejection altitude. I knew I was at a minimum of 15,000 feet so I looked at my watch and started timing my fall. The time was 0953 and 50 seconds, and I decided to fall for one minute before bypassing the barometric release. With several other things running through my mind, I lost track of time and the chute opened automatically at approximately 10,000' and the oxygen from my bailout bottle was still whistling through my mask. I put the mask back on and kept it on until the bailout

The fact that this pilot was an excellent swimmer was greatly in his favor. When he was picked up he was thoroughly chilled and nearly exhausted. Suppose it had happened to you?

bottle was empty. I then removed the mask and disconnected the hose to prevent any chance of it tangling.

Back at the time the chute opened I saw the plane in a tight spin and noticed several objects falling that couldn't all have been from the seat . . . I guessed the plane's altitude to be 4000'. It exploded on contact with more force than any depth charge I have ever seen.

At this time I became concerned about who was in a position to pick me up and if there was any sign indicating that people on the surface were aware of my predicament. Below me an oiler steaming north backed down and stopped as I watched it. However, I had a noticeable southern drift and to the south about 3 miles was another oiler and a seaplane tender. I did not try to guide the chute toward either of these ships but concentrated on dampening a severe oscillation which had developed.

At approximately 2000' I released my right leg rocket jet fitting and allowed my seat pack to hang from my left side. (*This is the opposite of the recommended procedure.*) I pulled the pack to my lap and refamiliarized myself with it so I wouldn't waste any time in the water. When I again let the seat pack hang from my left side, the oscillation stopped and I was then aware of my rate of descent. During the oscillation I was bothered some by the drogue which was swinging at about chest level; I grabbed it as it swung by and held it until just before entering the water.

At about 50 feet I straightened my body and got a good hold on the parachute rocket jet fittings. As I entered the water the fittings came free easily and I submerged approximately 6 feet. Upon surfacing I pulled the right toggle on my vest with no results. I put my face underwater so I could see the toggle and pulled again. I could see the firing arm with the cartridge was in the fired position and that it wasn't going to work. I repeated the same procedure with the left vest cartridge with the same results.*

The seat pan and raft were still attached to my left side and floating so I held on to them and

rested for a few seconds. I then pulled the O-ring which I first thought was connected to the raft cartridge. The ring came loose in my hand and the raft separated from the seat. The raft was floating free so I grabbed it and while I was turning it to find the CO₂ cartridge toggle, it unfolded.

By this time I was tiring rapidly and my flight gear had a tendency to pull me beneath the surface. I pulled the toggle on the raft two or three times with no results. (*Investigators thought the pilot probably didn't pull the toggle hard enough.*) At this time I realized the seat pan, still connected to me by the rocket jet fitting, had sunk and was pulling me under. I released the rocket jet fitting and concentrated on getting my breath. When I again turned my attention to the raft, I saw that it had sunk 3 or 4 feet and I gave it up. I tried inflating my life preserver orally but by then I was breathing too fast and weak. I tried to inflate my anti-G suit and managed to blow a couple of mouthfuls of air into it but this was not enough to counteract the weight of my flight boots.** Unable to keep my head above water by treading water, I gave up on all my flotation gear as it was necessary to use my arms to stay afloat.

After swimming for approximately a minute I noticed my parachute about 15 feet away still had large air pockets trapped in it so I swam over to it. While trying to use one of these air pockets to stay afloat, my feet became tangled in the submerged parachute. I nearly panicked and used a great deal of my strength fighting free of the chute. Another minute or so had passed when I noticed a helicopter coming my way. I got out my flare but was too weak to ignite it. When I looked again for the helicopter it had reversed course but I saw a small boat from the oiler heading directly toward me, approximately half a mile away. I paced myself so as to conserve my strength until the boat could reach me. The boat crew pulled me aboard and delivered me to the oiler where I was treated for shock and exposure . . . I had been in the water seven minutes.

. . . My APH-6 helmet was the most valuable of all my survival gear. The visor saved my face and eyes during the explosive decompression and later in the water the helmet itself was buoyant. The helmet also was the only part of me that could be seen by my rescuers. . .

*The cause of the life preserver's failure to inflate is unknown. On post mishap examination both CO₂ cylinders were found to be punctured. About two months previously one CO₂ cylinder toggle had been inadvertently actuated as the pilot left the aircraft. He had pulled the other toggle and the life preserver had inflated. The CO₂ cylinders were supposedly replaced. The vest was in good condition when checked by the parachute loft the following month. No mention is made of pilot preflight.

**This was heads-up thinking. However, before a survivor orally inflates his anti-G suit he should unspig the legs.

notes from your

Hand Injury

BECAUSE of a manpower shortage, two metalsmiths were assigned to check the starboard timer check valve on an S2A for hydraulic leaks. The required crew for this check is four men.

The AMS3 started the port engine while the AMSAN stood by with a fire bottle. The AMS3 cycled the wings from a fold to spread position. When the wings had cycled back to fold, the AMSAN climbed on a flat bed and reached in the fixed starboard wing section to feel for hydraulic leaks from the starboard timer check valve. He did not hear the usual popping of the wings as they were being spread again and continued feeling for leaks.

As the starboard wing began rising from the fold position the terminal end of the right hand inboard wingfold cylinder assembly caught the AMSAN's left hand and crushed it against the U-shaped connector of the winglock lockstrap.

Hearing the AMSAN scream, a man standing the line watch realized instantly what was happening, ran to the front of the aircraft and signaled the AMS3 to refold the wings. The victim's crushed hand was released and he was rushed to sick bay. He had broken bones in his hand with nerve damage.

Implicated in the accident were the manpower shortage, lack of qualified supervision on the night shift, poor judgment, and darkness.

Protection and Cold

..... THE preservation of body temperature when immersed even in the warmest ocean requires energy which at a very minimum must maintain a gradient of 7°C (12.6°F) which would still require an energy expenditure of 3,000 kg. cal. per day. Thus the mildest anticipated cold stress imposes daily energy requirements comparable to 8 hours of lumberjacking, or approximately 4 times the basal metabolic requirement The protective insulating effect of heavy clothing has been demonstrated frequently both experimentally and in the records of actual disasters. The particular temperature range in which added insulation makes the most significant contribution is 60-70°F. range where a small reduction in heat loss will prolong life three to fourfold.—*De Forest and Beckman "Archives of Environmental Health" Jan. 1962*

Much to be Desired

A STUDENT pilot who "flew into the ground" during touch and go landings had the following equipment discrepancies:

- His oxygen mask had not been checked or cleaned in three months.
- The bailout oxygen hose connector on his mask quick disconnect was loose by about two turns.
- Both CO₂ cartridge container caps in his life vest were loose.
- Although he had a good standard flashlight, his small

flashlight which he carried in the knee pocket of his cutaway anti-G suit was non-functioning because of weak batteries.

- He was wearing N-1 field shoes instead of his new flying safety boots which were back in his room at the BOQ.

Mr.—'s safety habits leave much to be desired.

Flathatting

AFTER the accident in question a witness described the aircraft's maneuvers as dives to low levels followed by climbs to 2000 feet and a steep bank followed by another dive. He made the comment to another man that if the pilot was not more careful he would kill himself. The aircraft was seen in the area for about 10 more minutes, then it headed north.

Shortly afterward it flew almost directly over a small island. Two residents working on their boat saw it pass over at an estimated 200 to 300 feet in straight and level flight, then begin a turn to the left with increasing angle of bank. The plane passed from view. Within seconds they heard the sound of impact and realized it had crashed some 1000 yards away. Both pilot and dual pilot were killed.

Investigating Flight Surgeon's Comments: "We all find ourselves at some time in a position or job category that does not test our full capabilities or provide an outlet for utilization of our specialty training. It is at these

flight surgeon

times that we must be doubly careful not to overstep the boundaries of good judgment or safety to ourselves and to others. Rather let us use that talent and drive to be the best of that to which we are assigned. Otherwise it can cost ours or someone else's life as in this case.

"Let's all strictly adhere to reporting safety violations. It is better to be a heel—to a live friend—the hurt soon disappears—than to be a good Joe who presents the flag to the next of kin."

Exit Troubles

AFTER a wheels-up landing in an EA-1E the pilot had considerable difficulty exiting the cockpit. Witnesses, though they could not accurately estimate the delay, described it as a "long time."

The pilot attempted to exit the aircraft before it came to rest but found he was still strapped in. He sat down, unstrapped and again attempted to exit. Still attached by the radio cords, he

took off his hard hat and tried a third time. He felt as if his parachute was binding so released the chest strap and left leg strap, then pulled himself out of the canopy and onto the port wing. Jumping off the leading edge of the wing, he ran 50 feet or so before stopping and picking up the parachute which, still strapped to his right leg, was hindering his ability to run. Once clear of the aircraft and at a safe distance, he released the right leg strap with no difficulty.

Panic is quite natural in this type of situation but well-formed habit patterns can effectively combat panic. Squadron practice drills pay off.

Zip Your Collar

BOTH pilots in an overwater midair collision ejected successfully. They had failed to zip up the necks of their Mk-5 anti-exposure suits and when picked up by helicopter only minutes after water entry, were soaked to the waist. Air temperature was 58.5° F. Water temperature was 46.6°

Strobe Light

SAR Pilot: In our arc around the survivor, a distance of possibly two to three miles, the strobe light was always effective. It is known by all pilots that when the flares are used and the tracers have all been expended, that the only means of visible (signal) at night is the flashlight. It is felt that the strobe light should become a mandatory item for all pilots on all types of flights.—From an MOR

Felled by Prop

AFTER a normal launch and uneventful hop, an A1H landed aboard the carrier followed a half minute later by a second A1H. The first aircraft was taxied forward and secured with the second in a position 18" directly aft.

As the pilot of the second plane cut his mixture off, securing the engine, the other pilot was climbing from his aircraft. He stepped onto the starboard wing, slipped and fell to the deck. As he started to retrieve his kneeboard, chart board and carbon monoxide tester which he had dropped, he passed into the arc of the second plane's propeller. The prop blade, which had almost come to a halt, struck him, knocking his hard hat off and throwing him to the deck. When he "came to" after several minutes unconsciousness, he was confused and disoriented and unable to remember events surrounding the accident. He had a broken shoulder and a brain concussion which will ground him approximately two months.



.... let's tell 'em it was a bird strike.

Quality

Quality Control Is Keystone

The keystone in a pilot's life is quality control. The lack of proper and adequate quality control has proved to be the gravestone of many pilots and is strongly suspected in the deaths of others. In this world of checked counter-checks and balances it is inconceivable that the ultimate check that could spell the difference between life and death is either overlooked or done in such a slipshod manner as to be tantamount to criminal negligence.

Quality control is no reflection on the ability of Navy mechs who number among the best in the world, but lack of quality control is a reflection of poor supervision and command attention to responsibility.—NavAirPac msg 12 Sept 1963

Just what is Quality Control? According to ole Daniel Webster's New World Lexicon (1960 Edition) one of the meanings of Quality is "the degree of excellence which a thing possess"; and Control, among other things, is defined as a "standard of comparison for checking the findings of an experiment." Ipso facto in naval aviation, quality control means "the degree of excellence which a thing possesses in comparison with a known standard" of operation.

Balance of Knowledge

In an effort to eliminate the experimental aspect of the maintenance performed on naval aircraft, BuWeps Instruction 4700.2 requires that the Quality Control Division "consist of a relatively small group of highly skilled maintenance personnel with working spaces located near the production divisions and also near the Maintenance Control Office." This is another way of saying that quality control personnel should have the wisdom of Solomon, the patience of Job, the strength of character of Thoreau, the inquisitive-

ness of Sam Spade, and then be located where they can eyeball everything. While the majority of our quality control men aren't of the gray-haired variety they should be selected for their maturity of viewpoint as well as their knowledge of their occupational skill. It is of utmost importance that a variety of occupational skills be represented in the Quality Control Division. While the matter of taxation is not involved, there is a matter of a balance-of-knowledge that is very important to their tasks and they supplement on another.

Duties

Personnel in the Quality Control Division should not be straddled with day-to-day tasks, such as running a Technical Publications Library (but it must be readily accessible to them) or writing up work orders (a maintenance control function), nor should they sit in their little dark cubbyhole waiting for maintenance personnel to bring them a work order for approval. Quality control people should be in almost constant circulation, eyeball-



Control

37

ing maintenance procedures, safety practices and other various and sundry things going on within any maintenance department.

In this respect they can be a tremendous asset to the maintenance chief and maintenance officer who are becoming more and more harassed with administrative details, and can't belly up to the coffee mess bar with the troops these days. With the introduction of the new WOWAR (Work Order & Work Accomplishment Record, NavWeps Form 4710/5 revised 5-62,) Quality Control now gets the *green* copy of the WOWAR so they know what's going on, before it starts!

Record Use

Intelligent use of these green sheets (Remember the San Diego "*Keyhole*"?) will enable the quality control men to stumble out to the metal monster with the repeat gripes and kinda peer into its innards before maintenance personnel swap another black box or wipe off the hydraulic or engine oil. While it is not intended that quality control personnel inspect *every* job, (that is the

Collateral Duty Inspector's job, see paragraph 1004.g. of BuWeps Inst. 4700.2), they should investigate maintenance practices and installations in aircraft that go down after every hop for *the same gripe*. This is one item in naval air that makes skippers grouchy, gives the maintenance officers ulcers, and makes old E-8s think twice about shipping for six! The only recurring excuse for a rush job is, "We were trying to make the flight schedule." But no excuse will ever salve your conscience when your negligence or oversight causes the death or injury of an innocent person. Pilots must rely on the maintenance personnel to repair their iron birds; (pilot's can't fix 'em and maintenance personnel can't fly 'em, but together they make a good team!).

Pilots certainly want the maintenance crew on their side, because they tell me that there's no lonelier feeling known to man than to be in the soup at night and the friend-in-the-earphones abruptly disappears or the torch-in-the-tail goes out. They say it gets so quiet up there you can

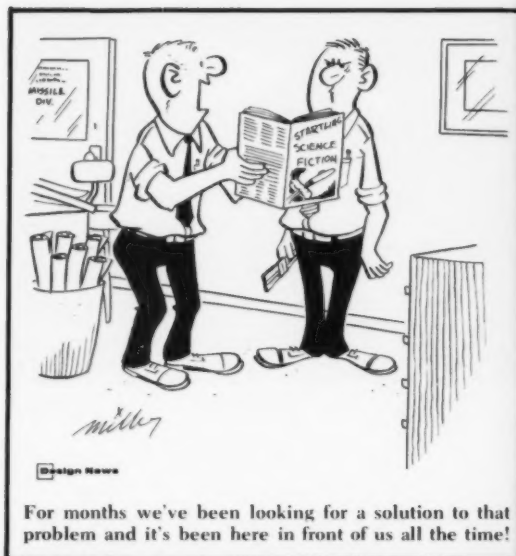
hear your heart beat! Good maintenance and intelligent quality control are our best means at present to prevent this kind of excitement, which the doctors say ages pilots faster than the wife's bills.

State of Mind

Quality control is also a state of mind. If you are one of those people who say, "I don't need anyone to check my work. I know what I'm doing!" Well, friend, you're way behind the times so you'd better shape up or ship out. It has been proven that a man can believe he is doing one thing and actually be doing something else. This strange effect is usually associated with fatigue, but it can occur with a person thinking about his problems, or even liberty, while working at a job. If you feel like people don't trust you or your work, and inspect it for that reason, you're all wet. If you weren't trusted you wouldn't be sent out to do the job to begin with.

Collateral Duty Inspectors are to assist the maintenance personnel in the sense of assuring that the discrepancy was corrected and everything was put together correctly. Actually if you young-in-heart men looked at quality control in the proper sense, you'd realize in this system you have a chance to show other people the type of work you are capable of doing. If your work has that degree of perfection called the "professional touch," you'd be surprised how much it will help your reputation as an expert. You'd be even more surprised how much value the old salts place on reliability and quality of work each of their junior men demonstrate.

I, for one, seek the opinions of each shop chief, collateral duty inspectors of that shop and quality control personnel in determining my recommendations when I sit on a Promotion or Proficiency Pay Board. I want the assurance that the personnel who get ahead of their contemporaries are ahead of them, in attitude and ability.



Cost Factor

The quality control concept hasn't changed aircraft maintenance in any way. The pilots break 'em and maintenance has to fix 'em. With the introduction of the more expensive aircraft (the F4U-1 in 1946 cost about \$53,000 and the F4B-1 now cost \$4,207,000), an interest by each of us taxpayers requires that all methods possible be developed to keep these new and expensive airborne conveyances landing on their wheels on the runway. Quality control, along with the more intensified training of maintenance personnel, were steps in the improvement of the maintenance system. These are by no means the final answers, there will be more and better innovations—a lot of them originated by the youngsters of today. So, let's set our known standards high enough that we can say our maintenance is *quality controlled*.—The Senile Sage in MAG-11 "Hotline"

Why?

Maintenance performed on aircraft without continuous quality control inspections or followed by inspection performed by person who did the work is *Worthless*—yet the practice persists!

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YOU and MEE

Well, the last mishap is over, for the present at least, and most of us have eased back to the less interesting part of our everyday duties.

While the brush fires of hazards, emergencies, and mishaps were in glow, Safety Officer types were going from area to area, shop to shop, even vehicle to aircraft in some cases, in search of the ever present bucket of coals. Raked over once again, we are concerned in some cases with what we found. There were the usual problems, of course, with broken supply lines and material failures, but the glowing ember that reflected light into our eyes during these visits was the age-old torch of supervising the mission effort.

This supervisory requirement must be met squarely by supervisors at all levels but definitely those at the action and working levels. This year and next, the number of new personnel, primarily trainees, will increase. In addition, supervisors will be troubled with the transition of their mission systems to newer and more complex aircraft. Each stop of the way along this bed of coals is marked by previous supervisors who supervised from SOP's, leaving the tong and fire iron work "to those who read them." Experience among the new personnel will be spread too thin to allow such poking around in the bucket of coals. Even now, with the retirement figures only on paper, many of our organizations are woefully in need of experienced supervisory personnel.

Let's face facts. Experienced personnel simply are not available at the drop of a hat. This has

been broadly proven by recent "retire 'em—hold 'em" procedures.

This is nothing new. Personnel who are questionably qualified have been arriving in units ever since the first flying machine was bought by the Navy. To this day, no one has ever been in a position to guarantee to the supervisor that newly assigned personnel are, in truth, qualified. This leads us to the standing truth that, regardless of the training it takes, the supervisor is responsible for ensuring that all personnel under his responsibility meet an acceptable standard—an established standard. Nothing can relieve him of the responsibility of knowing the level of proficiency of his personnel as long as they are crewing or maintaining the organization's aircraft. When a crewmember with a lot of time in the aircraft has trouble performing his job, it is reaching pretty far to lay the blame on lack of training. Someone should have spotted this weakness long ago and taken corrective action. When a maintenance man barely familiar with the aircraft causes it to hit the drink because he adjusted, installed, or serviced improperly, it is somewhat of an injustice to make maintenance error the primary cause. These things are supervisory in nature, and each year we are plagued with a certain percentage of this same type accident.

Let's tighten our supervisory belt—get our hands back on the controls—and put a stop to this gap in Maintenance Error Elimination.—Adapted from "Gamen Tots"

Where do YOU stand?

In aviation parlance there are accidents and there are incidents, and there are causes of accidents and incidents. They can be broadly categorized as parts failures, design deficiencies, and personnel error. It is common knowledge that the latter, personnel error, is the prime cause of damage mishap and injury. It is credited as the principal element in a high percentage of aircraft accidents and incidents. Some aspect of personnel error contributes to nearly all accidents and incidents. Aircraft and aircraft systems are conceived, designed, developed, and operated by individuals and groups of individuals. The success of the aircraft and systems is the product of personnel acumen; their faults, inefficiencies, and shortcomings result from personnel error.

It follows that aircraft accident prevention and equipment reliability can best be enhanced by an improvement in human reliability. What are the safety "specifications" for the ideal aircraft technician? Let us examine a few of the qualities and characteristics which are most desirable.

Maturity

The responsibility of aircraft maintenance cannot be satisfied by substandard people. It is a man's job. A job which requires an adult with sufficient maturity to recognize responsibility and the consequences of irresponsibility.

Job Knowledge

The complexity of our aircraft demands the attention of knowledgeable and expert technicians. Job knowledge is a function of education and training which, incidentally, does not end with graduation from a technical school. Any technician worthy of the name is continually training and learning through self-study and application, and through a personal desire for proficiency and self-betterment. But job knowledge by itself is not sufficient unless it is coupled with an old-fashioned craftsmanship that receives gratification and keen satisfaction in doing any job well. The technician who wishes to contribute to safety and reliability must know his specialty and must de-

velop a fierce professional pride in the quality of his work.

Purpose

The untrained, inexperienced mechanic is dangerous. He is a danger to himself, his associates, and to the public. His opposite is the careful purposeful technician who concentrates completely on his job at hand. He is constantly aware and alert.

Initiative

This attribute is closely associated with imagination, and it is almost synonymous with enthusiasm and energy. The lazy man does not exert himself to find, fix or adjust safety deficiencies. He waits for the malfunction. The ideal technician anticipates the malfunction and prevents its occurrence. He uses his imagination and initiative actively and enthusiastically to detect and remedy accident causes before they occur.

Integrity

The qualities of the ideal technician are not attainable unless the individual has the intelligence to recognize their desirability, and has the integrity to strive for their development within himself. The individual must have the wit to recognize that a neglected job not only invites accidents, but also reflects unfavorably upon his personal integrity. He must have the conscience which will cause him to detest any such reflection and the determination and will to prevent it.

These are but a few of the traits and characteristics of the ideal technician. It may appear that he must be a superman, but these are merely the virtues which build human reliability and prevent personnel error. These are the virtues which build self-respect and command the respect of others; virtues which differentiate between the journeyman and the incompetent, between the capable and the mediocre, and between the professional and the amateur. WHERE DO YOU STAND?

TWA Maintenance Information Letter



Why Use the HMI

When a new model aircraft first appears on the airports and in the hangars, it is a strange piece of machinery, unfamiliar to everybody except the indoctrinated few. At this time, the Maintenance Manual prepared by the airframe manufacturer is about the only source of information and guidance in the performance of maintenance. Usually, then, it is during this stage that the manual is most frequently referred to. After some time, as maintenance and operating experience have been gained, the manual has a tendency to become a shelf item only referred to during emergencies or lapses in memory.

This trend is unfortunate because the manual is not just a familiarization document, but continues to provide useful information from the time the airplane is introduced into service until it is retired. As experience is gained in operating and maintaining the aircraft, the additional knowledge is fed back to the manufacturer and the operator and included in the manual. This

process of modifying the maintenance practices as time goes on makes the manual a source of information that grows with the gain in experience.

This process of using experience to improve the manual slowly changes its contents to where it becomes reflective of all the combined experience of all the people working on the aircraft. The meaning of this to you is that, whenever you need a procedure for doing a job, you have the knowledge gained by thousands of other mechanics and technicians available to you. In this respect it is well to realize that, with the complexity of present-day airplanes, it is impossible for any individual to know everything about the whole aircraft. But, because the knowledge gained by others is reflected in the recommended procedure, you can eliminate the mistakes made by others before you. We believe that delays and maintenance problems could be drastically reduced if we adhered closer to the manual procedures.

The airframe manufacturer invests a considerable amount of money in the original preparation and the subsequent revision service. The Navy adds another sizeable amount in revising and maintaining the manuals. This is partly due to the tremendous amount of research and checking that goes into a procedure. And, every procedure has to be proven to be the best and most economical possible. Unfortunately, a lot of this time and effort is wasted because some people insist on using their own methods, or insist on experimenting rather than accepting a thoroughly tested and proven method. Usually this results in having to do it over again. Just remember, when you feel inclined to experiment, that you may be gambling with the safety of the aircraft and that, by yourself, you cannot possibly equal the amount of testing and experimenting that precede the write-up in the manual.

Of course, the manual is the basic document, on the basis of which the aircraft is certificated; but, of more personal importance, is the fact that you were part of the team whose knowledge and experience were used to make the manual what it is today. You can continue to help improve it, either by proving more existing procedures to be right, or by suggesting changes to improve them. This way you benefit from knowledge gained by others and prevent the mistakes that have been made by the other fellow. But more important, you will be helping the next man do a better job too. — Delta Airlines "Technical Review"

A modified Malfunction Reporting Program gets underway with the New Year. The scope of reporting on in-production aircraft will be expanded while reporting on out-of-production aircraft will be reduced. Here are the details.

Report Symbol BUWEPs 1307

1. Reporting Activity	2. Report Ser. No.	3. Date Of Trouble	4. Installed In Aircraft/Arrest. Gear/Catapult/Support Equipment Model		5. Aircraft Logbook Time	
6. Model Designation And Model No.	7. Nomenclature		8. Serial No.	9. Time Meter Read./Logbook Hour meter Logbook hrs.	Time or Events (if applicable) Starts Landings	
10. Manufacturer's Part No.	11. Nomenclature		12. Serial No.	13. Mfr's Code No.	15. Time Or Events Hrs. Starts Ls	
16. Manufacturer's Part No.	17. Nomenclature		18. Serial No.	14. Contract No.	19. Mfr's Code No.	
20. Location (if applicable)						

Malfunction Reporting Program Modifications

Much greater use can be made of the improved and expanded FUR form.

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IT was bound to happen. Like other long established management programs before it, the increasing complexity of naval aeronautical weapon systems has also caught up with the BuWeps Malfunction Reporting Program. The generation of this complexity and its effect on maintenance operations made it necessary that an improved system be developed for more comprehensive collection and analysis of data on aeronautical material.

Basic to the success of the FUR system is the complete dependence upon the information which is received, compiled and analyzed. The limitations and shortcomings of the long-standing NavAer 3069 and DD-787 forms with respect to present weapon system requirements were recognized. Therefore, a detailed study of failure data requirements and usage of these data was made jointly by Navy (BuWeps) and industry representatives. From this study evolved an improved and expanded FUR report form. The new form, previously used on selected aircraft only, is designated the "Failure, Unsatisfactory or Removal Report (NavWeps Form 13070/3)".

This form expands data collection over that of the previous reports and is the basic report for all commodity areas including electronics. The functions of the NavAer 3069 and DD-787 forms are now combined into a single report form. The new FUR form further permits grouping of defects and failures by functional system, component, sub-assembly and part, thus providing for more rational analysis of

material and maintenance deficiencies.

In order to concentrate available analytical effort in the most important aircraft areas, several program changes will be made, effective 1 January 1964. Those of specific interest to reporting activities are:

- Reporting on FUR (NavAer Form 3069) and EFR (Form DD-787) will be discontinued for all naval aircraft and aircraft material after 1 January 1964.

- FUR (NavWeps Form 13070/3) will be used to report all failures, deficiencies, or malfunctions of aeronautical material on *in-production* aircraft (A-4E Model, A-5, A-6, CH-46, E-2, F-4 Series, F-8E Model, H-2, H-3, P-3, QH-50 Series, S-2D, S-2E Model, and T-39 Series.)

- On all other naval aircraft the FUR (NavWeps Form 13070/3) will be used to report *only* Safety of Flight AmpFURs, Urgent AmpFURs, Quality Control Discrepancies, and in those instances where material accountability documentation is required.

Instructions for the preparation and submission of the new FUR form are detailed in proposed BuWeps Instruction 13070.1B. All activities are requested to give their fullest support to the Malfunction Reporting Program as modified. Strict adherence to the instructions for submitting reports will assist in achieving program objectives.

Remember, effective date for implementation of the NavWeps 13070/3 form is 1 January, 1964.

NOTES AND COMMENTS ON MAINTENANCE

Purge The Word 'Carelessness'

From Jim Saul, editor of the *National Safety News*, comes this missive—aimed at his fledgling writers, but useful to all who write about safety.

Many partly-informed writers make the statement that 85 percent of all accidents are caused by unsafe acts, thus arguing that "it's their own fault."

According to "Accident Facts," in about 85 percent of accidents, both an unsafe act and an unsafe condition are present.

Let us make this clear whenever this misinformation is repeated.

The causes of unsafe acts are:

1. Harmful attitudes,
2. Lack of knowledge or skill,
3. Physical or mental disability,
4. Temporary emotional state.

Any of the four causes of unsafe acts might cause inattentiveness, but let us purge ourselves of the word "carelessness."

The vague word, "carelessness," has no place in safety communications except to refer to an outmoded way of dismissing accident causes.

National Safety Council Newsletter

FUR/Hose Failures

Proper use of the FUR reporting system often spotlights a trouble area before a major mishap occurs. But here's a case in which improper usage was not discovered until we lost an A4B. Cause of the accident was determined as failure of a soldered ferrule on liquid oxygen flex hose. Further investigation revealed that a very high replacement rate of flex hoses existed but was not known because single sheet FURs were used to get replacements. This was especially true for those aircraft undergoing PAR where each hose is pressure tested. Replacements amounted to 65 percent—a pretty good clue as to hose reliability—if it were known.

Remember, if a replacement part is needed, make out a FUR set. In this way we'll all get word.

NAVWEPS 00-80T-96

AIRCRAFT SUPPORT EQUIPMENT

General Handling & Safety Manual



ISSUED BY THE OFFICE
OF THE CHIEF OF NAVAL OPERATIONS
AVIATION TRAINING DIVISION
U.S. NAVY, 1962

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NOW AVAILABLE—The whole story of aircraft support equipment and the men who handle it. This book is chock full of money-making, life and time saving tips to people who help stage the "Greatest Show on Earth"—the launching, landing and ground handling of naval aircraft. Invaluable dope for the operator, instructor, student or old-time line chief. Every outfit should make good use of this easy-to-read manual. If you don't have copies, order them now from your nearest Aero-Pubs facility!

ON or OFF

THERE MUST BE NO half measures—panels, cowling and inspection doors must be either **OFF** altogether or **ON** and secured by all their fasteners.

Do—ensure that all fasteners are correctly locked with screw slots lined up with the marks on the panel.

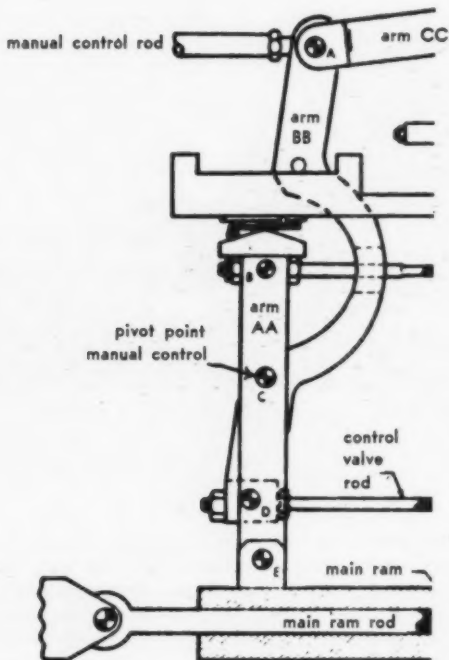
Do not—fit a panel by just a few of its fasteners.
—Royal Navy's "Cockpit"

Too Tight To

A RECENT report states that the pilot of an F-4B experienced an excessive porpoise maneuver that was very near "unvontgolable"[sic].

Cause of interference was excessive binding of manual pivot point "C" connecting arm "AA" and "BB", ref NavWeps 01-245FDB-2-6-3 Fig 2-11 which is reproduced in part here.

Binding was caused by an overtightened nut at



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point "C" of the Integrated Stabilator Power Control. The nut is an AN-320-10 shear nut $\frac{3}{8}$ " x 18. This causes arm "AA" to tighten on arm "BB," consequently the feedback does not operate efficiently for safe stable flight.

The bushing design and installation are considered unsatisfactory on this actuator. Recommendations include re-design of bushings and pivot points as soon as possible. Meanwhile, operating units should make this a special subject for quality controllers and insure inspection for free operation.—*Flight Safety AmpFur*

A-4E Tips

Excerpts from a recent letter from the CO, VA-81:

There is a much higher volume rate of flow of air into the intakes of the A-4E with the engine at IDLE than that in the A-4B/C. Consequently the old practices of passing pins or notes to plane captains, taxiing with arms resting on canopy rails with objects in the flight suit pockets, etc., must be strictly eliminated. Most certainly, seat and canopy safety pins must not be inserted or removed while the engine is running. A great deal more respect must be given to the intakes of the A-4E with the engine running.

Contrary to information contained in the A-4E Flight Manual, the new gas-initiated nitrogen bottle canopy jettison mechanism will allow the canopy to be jettisoned in any position, both on the ground and in the air. If the person removing the safety pins from the rocket motor firing head and canopy mechanism is in an awkward position or does not exercise due care, it is easily possible for the rocket motor safety pin to hook the canopy firing cable and to jettison the canopy. This would be especially true at night or during a hurried preflight. It is recommended that the canopy safety pin be removed last, that extra caution be used in removing all safety pins and flags, and that all pilots and plane captains be carefully indoctrinated in the additional precautions warranted.



TOOL CABINET—A means of increasing tool accountability. VT-22 modified the standard rolling tool cabinet by adding pins, partitions and racks in the drawers and compartments. Contrasting colors and labeling assure availability of tools and a simplified tool count when a task is finished.

Tool cabinet, GSA 5140-608-4757, can be modified by using the miscellaneous stock found in all metal shops, in 8-10 man-hours between tasks. — J. R. Waterstreet, Capt, USMC

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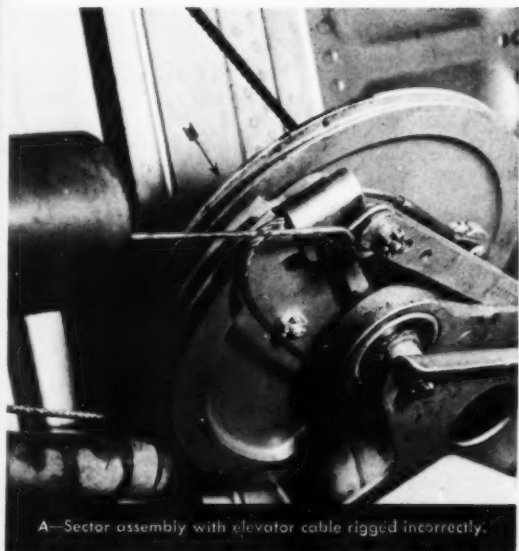
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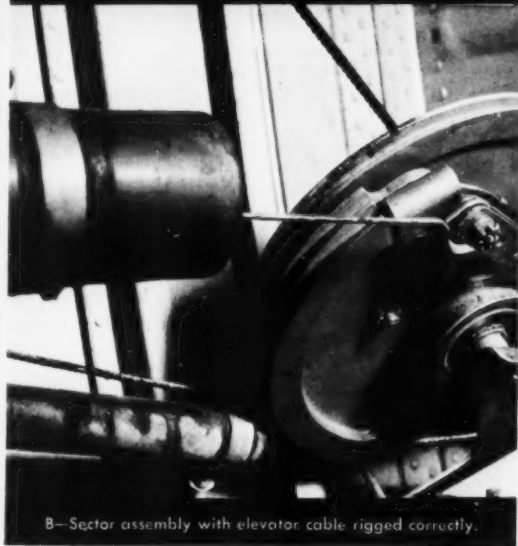
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MURPHY'S LAW*



A—Sector assembly with elevator cable rigged incorrectly.



B—Sector assembly with elevator cable rigged correctly.

Rigged Wrong — A4C

INSPECTION of an A4C with a history of excessive nose-down pitch change when the autopilot was engaged during flight revealed the culprit to be improper elevator cable rigging. Improper rigging also affected normal stick positioning during speedbrake operations.

Quality controllers noted that during tail removal there is slack in the nosedown elevator cable 7445535-623. If the notch in the sector assembly 3550900 is lined up with the cable retaining pin, the cable can slip out of the groove (photo A). When the tail installation crew hooks up the cables, even though not in the sector groove, enough tension remains on the cable to give the feel that it is properly in place.

Particular attention is essential during tail installation because visual detection is somewhat difficult. The sector assembly, located at station 308, is partially hidden by the AJB-3 displacement gyroscope assembly and is in close quarters created by the tailpipe.

The squadron flew two aircraft in this condition before this discrepancy was noticed. Other A4C squadrons should benefit from this experience.

—LTJG E. K. Bannan Quality Control Officer
VA-192

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* If an aircraft part can be installed incorrectly, someone will install it that way!



Want your safety suggestion read by nearly a quarter of a million people in naval aviation? Send your constructive suggestions to APPROACH.

Letters

Variable Heading Tacan Approach Plate

NAS Lemoore—Prompted by many of your fine articles concerning CATCC procedures and especially LT Lubbers' article "Night Fright," I have developed an approach plate for carrier use and am forwarding same with an explanation sheet.

Use of tacan approaches, landbased and afloat, is one of the primary methods of controlling aircraft to a landing. There is one basic difference between the two types of approaches, the carrier's capability to turn its runway through 360 degrees. To make an approach plate for each approach heading is out of the question so the pilot must use an approach plate bare of any specific heading information and compute the necessary courses for himself after getting his holding instructions. This takes valuable time and is many times inaccurate. The pilot then has to rely on CCA to supplement his approach which in turn causes CCA/LSO/pilot radio frequencies to become overloaded and confusion to set in.

With the foregoing problems in mind, I respectfully submit this variable heading approach plate which I have devised. It will eliminate the pilot's problem of computing the various headings of his approach procedure and permit him to fly his approach without help from CCA. It will also give him a two dimensional picture of his position in relation to the ship's course.

The device is constructed in three parts of materials which are sturdy yet inexpensive. The approach depicted on the face of the approach plate is a 225-degree relative bearing prop approach procedure currently being used by one of our super carriers. Sandwiched between this transparent plate and the back plate

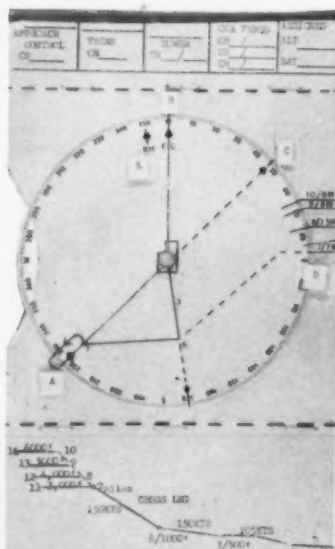
is a plastic circle marked off in 360 degrees. The assembly is bonded at five places; both ends, the two dotted lines and by a rivet through the centers of the carrier and the plastic circle. The sides are not bonded which leaves a small pocket at the top and bottom of the assembly for a frequency card and an approach profile card. With standardized approach procedures, it would be possible to manufacture this device in quantity.

To operate the approach plate the pilot need only receive the ship's foxtrot corpen or a holding radial and an assigned altitude with a ramp time. The entire approach as depicted is prefigured for a 30-knot relative wind. When the pilot re-

ceives either the holding radial, which is placed under A, or the foxtrot corpen which is placed under B by rotating the movable compass card, the approach plate is set up for all other computations needed to execute the entire approach.

By referring to C he will read the inbound course for the holding pattern and at A he will read the outbound course for holding. At D the pilot finds a numeral followed by a slant mark, a numeral and the letter M. The first numeral indicates the mileage fix for the holding pattern. The second numeral and letter indicated the estimated time enroute in minutes from that particular holding fix to the carrier. The inbound heading and runway heading is taken from E, marked RH.

A sample approach using 360 degrees for the foxtrot corpen and using the approach as depicted on the pilot model would go like this. The pilot receives his holding radial (225 degrees) with a holding altitude of 3000 feet and ramp time of 07. By rotating the compass card to place 225 degrees under the holding pattern at A or place the foxtrot corpen, 360 degrees, under B marked FC all other computations needed to fly the approach have been computed and need only be read from the plate. The inbound heading for the holding pattern is read from C, 045 degrees and the outbound heading is taken from A, 225 degrees. By referring to D, the pilot finds that at the seven-mile holding fix the cross-leg heading to intercept the six-mile fix on the final approach course is 086 degrees. The time from initial approach fix to the ship is seven minutes; therefore, he must depart the holding fix on the cross-leg heading on the hour (00), to make his ramp time of 07. By referring to E the pilot gets his inbound course and the runway heading



of 350 degrees. This heading varies with the degree of angle for the deck landing area.

By using this device, which can be adapted to any approach pattern and computes all courses of the approach, the pilot has an approach plate comparable to that used at land bases. I have flight tested this approach at land based tacan stations using computations for no wind conditions/as the pilot model is prefigured for a 30-knot relative wind, and is proved very satisfactory. I have submitted this plate through my chain of command to CNO for possible adoption. To date it has received favorable endorsements from CVG-12, ComNav-AirPac and it is somewhere in OpNav at the present time. I sincerely hope this device will help improve carrier approach procedures.

ROBERT Q. JAMESON, LT

Two Questions

Monterey, Calif.—I have two questions concerning flight equipment:

First, is there any modification expected to adjust the LOX Mini-regulator system so breathing can be accomplished unplugged with the mask on? At present it seems a potentially unsatisfactory situation. A pilot has one little problem after an accident if he cannot remove his mask due to unconsciousness or some other disability—breathing.

My second question concerns personal bags to contain the torso harness and associated life preserver. Certainly most pilots have a locally manufactured container but many do not. The advantages of a container are many, such as less chance for inadvertent inflation of the life preserver, cleanliness of the equipment, etc. If no storage is available at the air station the chance of damage is high. What is the official decision on the availability and source of a torso harness container?

K. C. BROWN, LT

• Both your questions were referred to BuWeps. The Bureau advises that an anti-suffocation valve is still under development. The Bureau will look into the subject of the parachute bag.

50,000th Accident-Free Flight Hour

New Iberia, La.—When "Heartless 438", a TS2A piloted by Naval Aviation Cadet C. L. Stein, landed recently, VT-27 logged their 50,000th accident-free flight hour. That landing marked the most important flight safety record



ever achieved by VT-27.

Commander James E. Tout, Commanding Officer of the squadron, and the squadron Safety Officer, Major L. J. Oltmer, met Cadet Stein when he came into the aircraft parking ramp to extend their congratulations. Commander Tout and Major Oltmer together have flown a total of 12,500 accident-free hours, of which 3900 were in the S-2A aircraft.

While accomplishing the 50,000 accident-free hours flying the TS-2A "Tracker", the pilots of VT-27 logged statistics which gives the record even greater significance. During the 17-month accident-free period, they flew a total of 18,700 flights which logged 108,677 landings. Of the total landings, 37,700 were Field Carrier Landing Practice, and 4614 were carrier landings.

VT-27's record in training student Naval Aviators safely without accidents is a goal all aviation squadrons strive to achieve. The squadron's record in total student completions with its aircraft and personnel complement shows the record was achieved while operating at near maximum performance.

SIO

Cross-Country ILS?

NAS Dallas—Upon flying into Dallas NAS recently, I decided to make a practice ILS approach. During the approach I became confused because:

1. The approach glide slope was not into Dallas NAS itself as in all other ILS approaches I have flown.
2. The unusually high landing and

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, U. S. Naval Aviation Safety Center, NAS Norfolk, Va. Views expressed are those of the writers and do not imply endorsement by the U. S. Naval Aviation Safety Center.

low approach minimums of 600 feet as opposed to 200 to 300 feet in other ILS approaches.

3. The approach does not terminate in a straight-in landing as in other ILS approaches.

In summary, the approach seems quite a deviation from the normal ILS approach, and requires a very thorough reading of the letdown plate. I had at first chalked up the error as my own. Since then, however, I have overheard another pilot say the approach was confusing.

The fact that others have had trouble makes it clear that even though the approach plate explains the procedures, errors have occurred, and will occur again.

In fact, some doubt arises in my mind as to whether the procedure can properly be called an ILS.

CAPT USAF

• As you now know Captain, the approach is a primary landing aid for the civil field northwest of Hensley. Extending it to NAS Dallas is a convenience for those aircraft equipped to receive localizer and glide slope indications. Very few Navy aircraft are equipped for this so the problem has not been mentioned before.

By strict interpretation the approach cannot be classed as an ILS but again, for convenience, it is labeled that way. Because of Hensley's frequent use by your fellow officers we are taking the liberty of forwarding a copy of your comments to "Aero-space Safety."—Ed.

Solution for Slipping

FPO San Francisco—Aircraft corrosion prevention is a very important job to a plane captain and a very dangerous area if the preventive measures include the washing of aircraft with water and/or aircraft cleaning compound. Aircraft washing personnel are in constant danger of slipping and/or sliding off the aircraft's topside.

Personnel on this squadron's flight line have found that rags wrapped around their shoes so as to completely cover the soles has reduced accidental falls to a minimum.

Through testing I have found that a one-half inch felt pad cut to the shape and size of my boot soles and strapped to them from four positions has eliminated my slips in water, water and cleaning compound and in JP-5. These felt soles can be made in a matter of minutes and can save many lost man hours, personal pain and discomfort.

J. E. KEITH, PFC, USMC
VMF(AW)-542



approach

NavWebs 00-75-510

VOL. 9 NO. 6

Our product is safety, our process is education, and our profit is measured in the preservation of lives and equipment and increased mission readiness.

The Aviation Safety Story

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What else is wrong?

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MOST
accidents
are the re-
sult of an un-
usual coincidence
of unexpected or
unfavorable events.

The pilot may know that
one instrument is malfunction-
ing or that visibility is marginal
(though the ceiling may be above
minimums), but what else is wrong?

Perhaps this would be the time for the
pilot to ask that question, e.g. when he
knows that there already is one potential
source of trouble. In a recent fatal accident the
pilot knew both ceiling and visibility were variable
but close to his minimums, and he knew the PAR was
inoperative as was the Middle Marker compass locator.

However, he did not know that both the "Hot Line" and the
Telautograph link between the Weather Bureau and the
tower also were "Out." Had he known this, he might well have begun
to feel the deck was stacked against him and so diverted to
another airport. This might be called the "Checker Syndrome"—an accident
resulting from a sequence of events. (In this particular instance we are
borrowing the medical term which means "a set of symptoms which occur
together and characterize an ailment.") To demonstrate this, take
five or six checkers from a checker set (the game) and balance them on end and
in a row, each separated from the next one by a distance almost equal to
the height of a checker. Knock the end piece down and they'll all fall, but take any
one out and the remainder will stand up successfully. Next time an
unfavorable event occurs, ask the tower (and yourself), "What else is wrong?"
By the way, our study of transport weather accidents shows that accidents are more likely
to occur when either ceiling or visibility is at minimums, rather than when both are at
minimum. *Flight Safety Foundation*



